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JUNE, 1905.

$2.00 per year.
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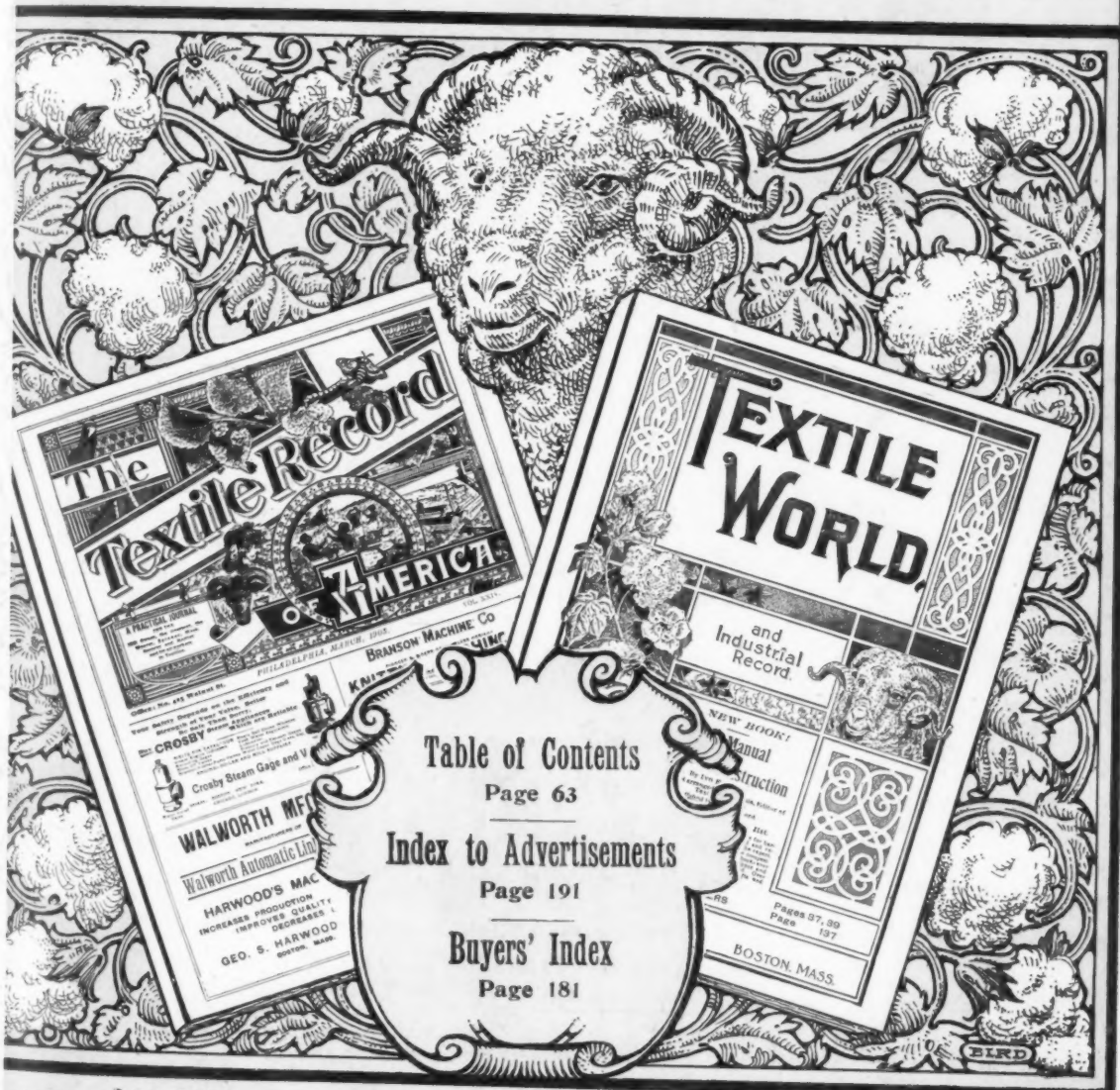
TEXTILE WORLD RECORD



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ORD & NAGLE COMPANY · Boston & Philadelphia

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The Textile-Finishing Machinery Co.

17 EXCHANGE PLACE, PROVIDENCE, R. I.

Mercerizing Machinery for Piece Goods and Yarn in the Warp or Chain

Singeing Machines,

Boiling Kiers,

Washers, Squeezers,

Chemic and Sour

Rusden Patent

Continuous Chainless

Steamer,

Aniline Agers,

Dyeing Machines,

Open Soapers,

Blanket Washers,

Color Kettles,

Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders,

Automatic Tentering Machines,

Water and Starch Mangles,

Dampening Machines,

Dyeing Machines for Chain Warps.

BUILDERS OF ALL KINDS OF

MACHINERY

FOR

BLEACHING
DYEING
DRYING

AND

FINISHING

Calenders for Rolling, Glazing, Chasing and Embossing, also Callenders for Moire Finish.

Sole Manufacturers of Patented Flexible Cloth Expander for Cylinder Drying Machines, Calenders, Mangles, &c.

Patent Combination Rolls Made of Cotton and Husk, especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-deposited Copper Rolls for all Purposes.

Padding and Drying Machines for Shade Cloths.

Single and Double Cylinder Engines.

Hydraulic Presses and Pumps.

ALL KINDS OF OUTFITS FOR BLEACHING THREAD AND SOFT TWISTED YARN.
BLEACHING MACHINERY FOR YARNS IN THE WARP OR CHAIN.

Estimates, Drawings and full particulars of complete plants furnished on application

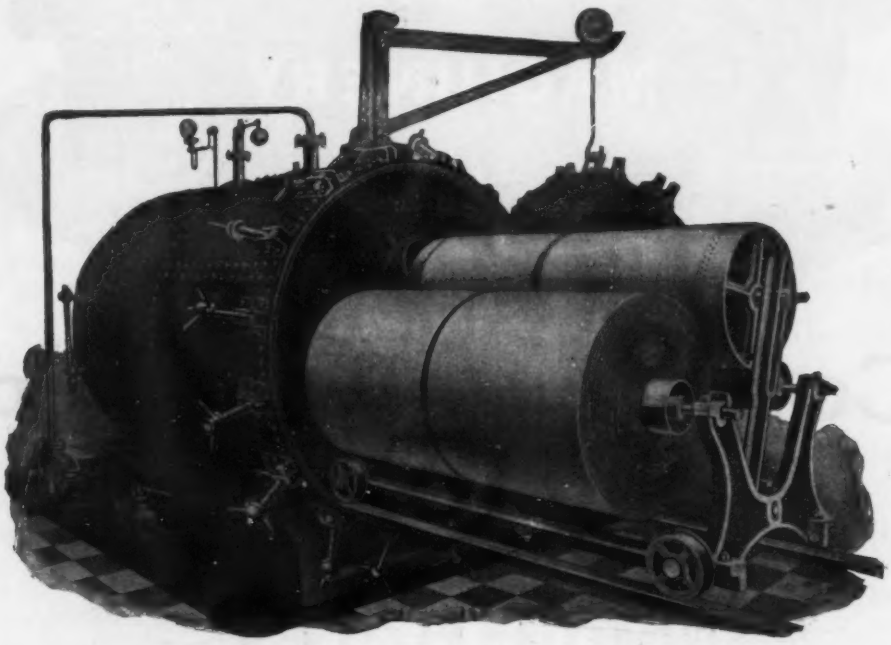
Southern Agent, STUART W. CRAMER, Trust Bldg., Charlotte, N. C., Equitable Bldg., Atlanta, Ga.

Open Bleaching System

OF

JACKSON & HUNT

Patented in the United States, Great Britain and the Continent
U. S. Patent, January 15th, 1901. No. 666,056



H. W. Butterworth & Sons Co.

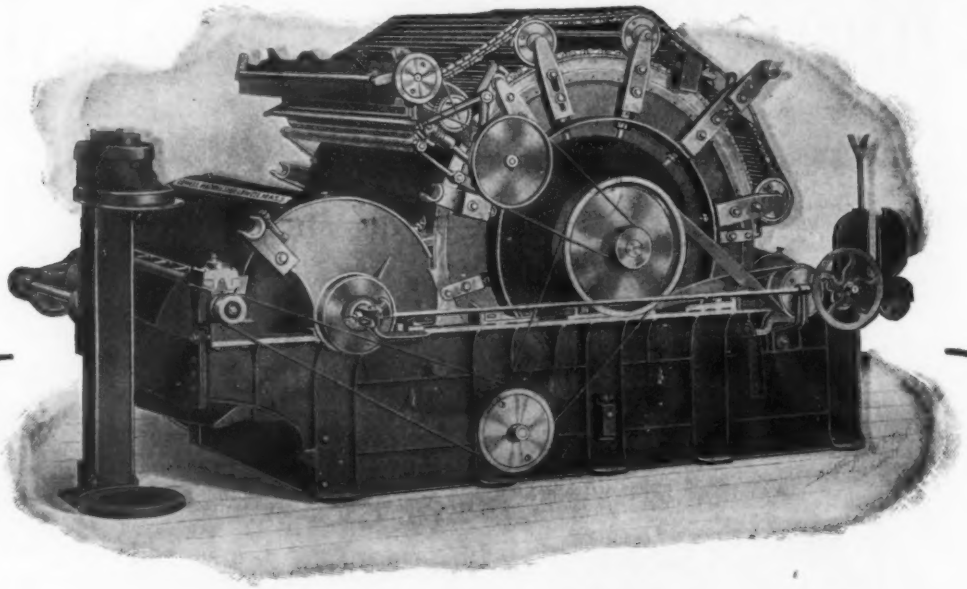
Manufacturers of

Bleaching, Dyeing, Drying and Finishing Machinery

YORK AND CEDAR STREETS

PHILADELPHIA

Sole Makers for the United States



Cotton and Worsted Machinery

With Modifications to Suit Any Class of Work.

Cotton Machinery: Cards, Railway Heads, Drawing Frames, Fly Frames, Speeders, Ring Spinning Frames, Twisters, Spoolers, Reels, Warpers, Slashers, Winders, Looms, Shearing Machines, Balling Machines, Folders, Stamping Machines, Sewing Machines, Size Pumps, Size Kettles, Drawing-in Frames, Baling Presses, Indigo Grinders.

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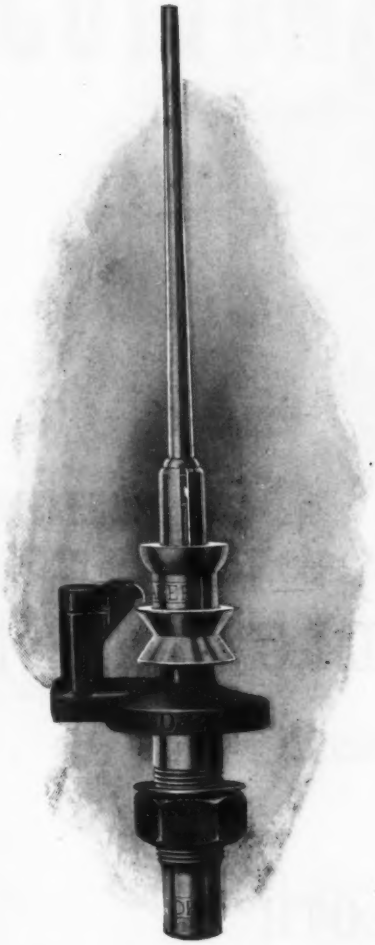
LOWELL, MASS.

A New Spindle Improvement



The Rabbeth Centrifugal Bobbin Clutch.

Fits the Bobbin loosely when at rest—allows considerable variation in fit.

Bobbins will all go down into place and Traverse can be lengthened.

Allows easier and quicker doffing — stronger bobbins — less reaming.

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We Also Build Looms.

THE

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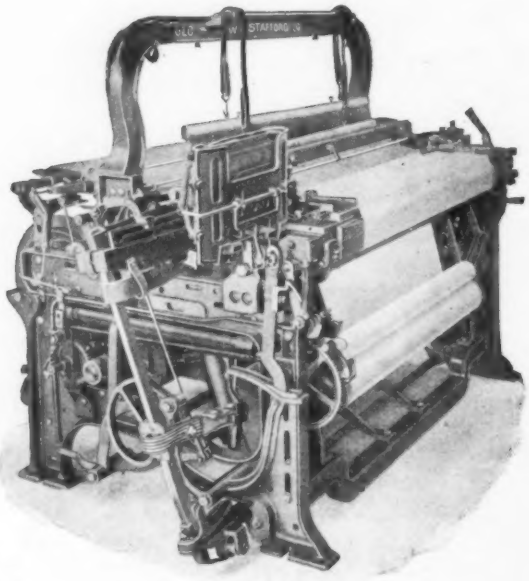

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which weaves

THE BEST CLOTH

THE MOST CLOTH

THE CHEAPEST CLOTH

WRITE FOR CIRCULARS AND FURTHER PARTICULARS.

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NEWTON UPPER FALLS, MASS., U. S. A.

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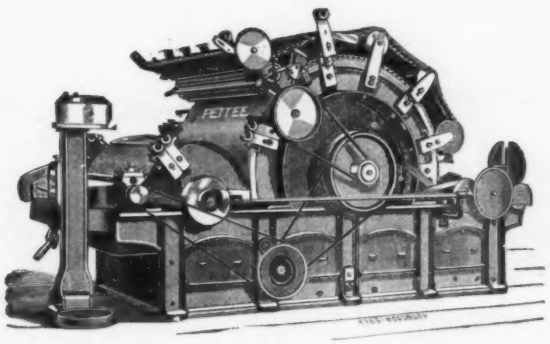

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Cotton Machinery

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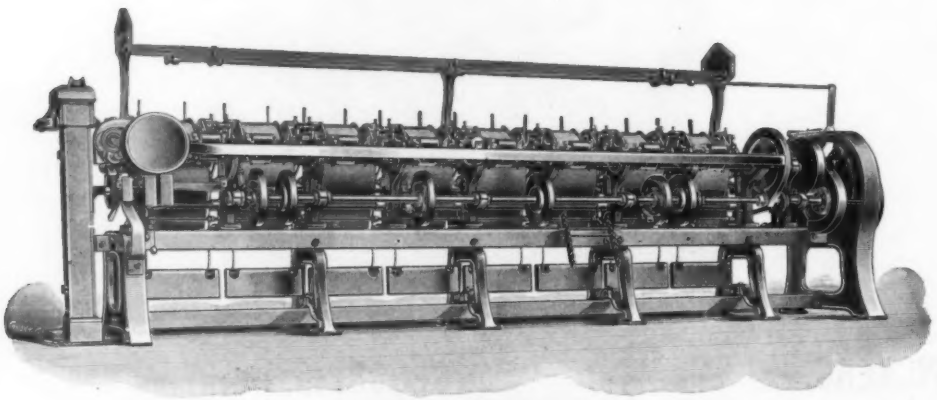

The Whitin 8 Head Comber.

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and Equitable Bldg, ATLANTA, GA.

Revolving Flat Carding Engines,
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Combers,
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Drawing Frames,

Spinning Frames,
Spoolers,
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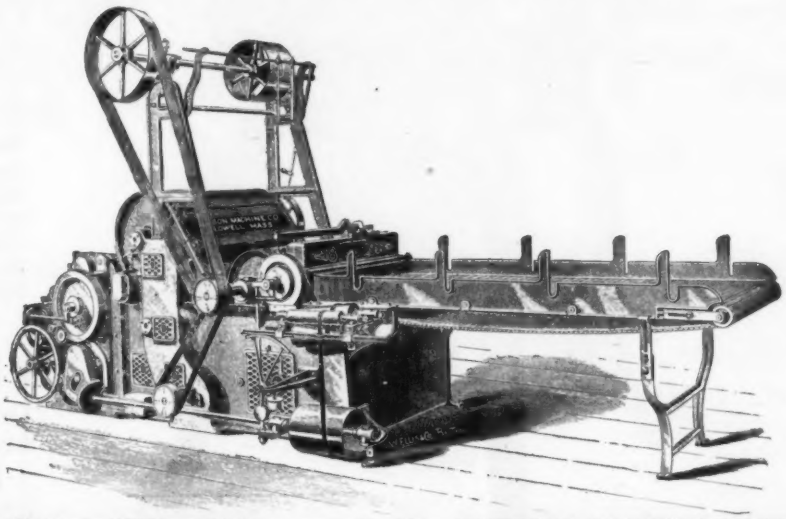
The Best Pickers

In the Cotton Field nothing equals the DARKY COTTON PICKERS.



In the Cotton Mill nothing equals the KITSON COTTON PICKERS.

KITSON MACHINE CO., LOWELL, MASS.

LARGEST BUILDERS OF COTTON OPENERS AND LAPPERS IN THE WORLD.

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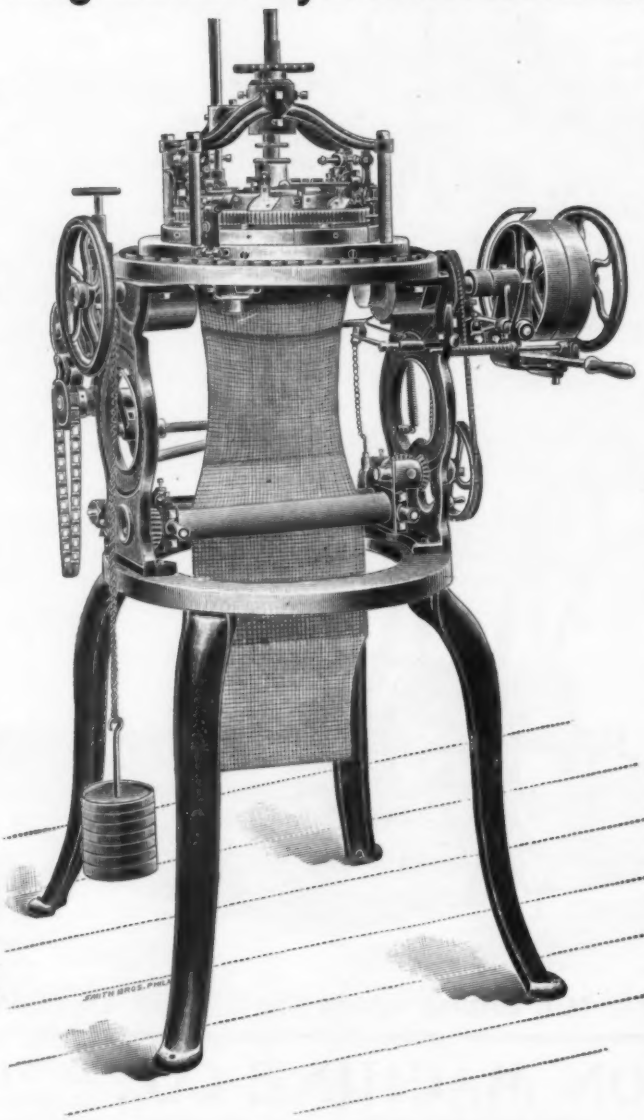
BUILDERS OF

Rib Knitting Machinery for Underwear and Hosiery

The illustration shows our

Improved High Speed Single Lever Automatic Ribbed Underwear Machine

for making ladies' and gents' ribbed underwear, union suits, etc., plain and shaped.



Plain, Single Lever or with Welt, Slack Course and Automatic Slackening Device for Welt.

Improved Measuring Device, by actual length knit.

Sizes, 8 to 24 inches, inclusive, varying by one inch.

Number of Feeds, four to 12, according to style and diameter of machine.

Solid Forged Steel Cylinders, specially hardened or with patent inserted walls for fine fabric.

Special Machinery for Sweaters etc.

We build Loopers, Ribbers and other Machinery for Knitting Mills

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A Complete Line of Full Antomatic and 7-8 Automatic Seamless Hosiery Machinery.

Full Particulars, Samples and Special Catalogues on Application.

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Hand or Power, Open Top or Hold Down.

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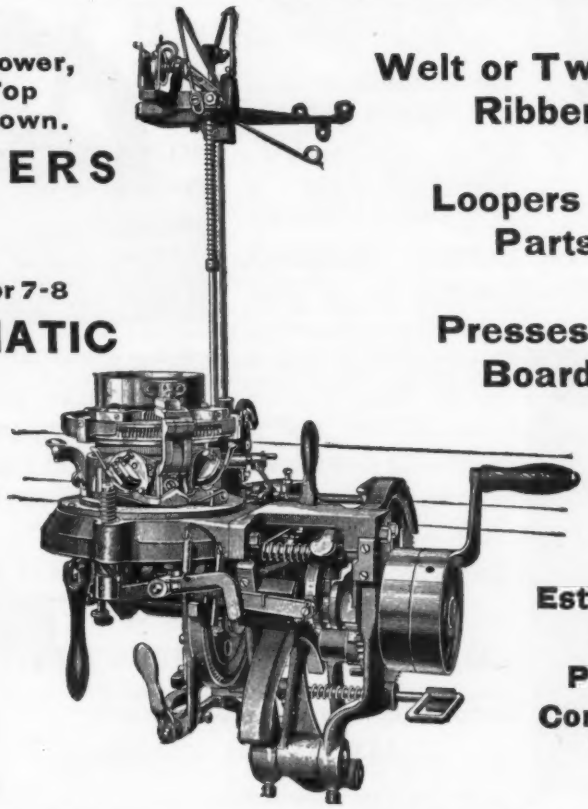
1-2, 3-4 or 7-8

AUTOMATIC KNIT-TERS

All Sizes and All Gauges.



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Loopers and Parts.

Presses and Boards.

Estimates for Plants Complete.

Winders and Bobbins. Hand Forged Steel Cylinders.

BRANSON MACHINE CO.

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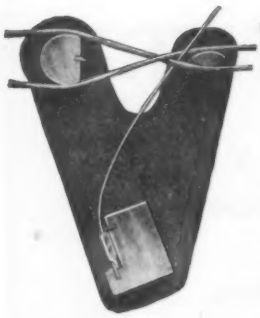
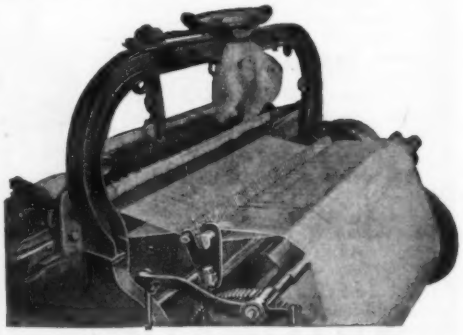
Write for information and Catalogue.

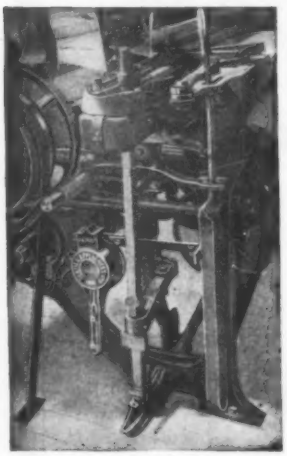
Absolute Efficiency from Bed-Rock Simplicity



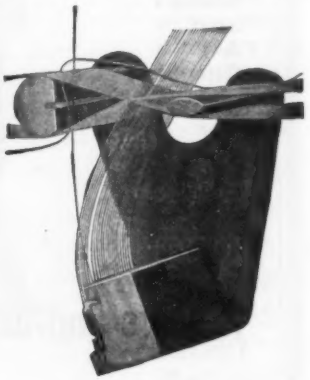
Our **WARP-STOP** controls **TWO threads by ONE spring WIRE, held in a COMB,** engaging the warp in such a way that **the TENSION is UNDER CONTROL,** and **ABRASION of the yarn is AVOIDED.**



The COMBS are RAPIDLY INSERTED, BEFORE or AFTER the warp is in the loom, and are carried in a bar suspended from **the LEASE-RODS** which **ARE NOT FIXED** to the loom side, but **FREE to take their proper positions,** and **ALLOW the NATURAL MOVEMENT of the WARP,** so that **the COVER of the cloth is UNAFFECTED.**



When a thread breaks the WIRE SPRINGS OUT from the comb, thus giving **a CLEAR SIGNAL of the place of the BROKEN END,** and, by striking **a CONTACT SLIP upon which LINT CANNOT COLLECT,** closes the circuit through **a PERFECT KNOCK-OFF, EASILY and RAPIDLY FIXED,** and **actuated by a SPARKLESS current.**



American Textile Appliances Co.

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79 MILK ST., BOSTON, MASS.

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Platt's Patent Opening and Picking Machinery.
Platt's Cotton Comber will comb from 7-8″ stock to Sea Islands.
Platt's Special Machinery for Making Cotton Waste into Yarns.
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MATHER & PLATT, LTD.

Dyeing and Finishing Machinery. Archbutt-Deeley System for purifying and softening water.

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Flax, Hemp and Jute Machinery.

THE PATENT AUTOMATIC FEEDING MACH. CO., LTD.

Patent Feeding Machines for wool, cotton, flax, fur and fibrous material

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Looms for Worsteds, etc.

JOSEPH SYKES BROS., Card Clothing for Cotton.

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DRONSFIELD BROS'. Grinding Machinery and Emery Filleting.
The Best French and English Combing and Rubbing Aprons.
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"One Machine Instead of Two."

The Nasmith Comber

Doubles the production of any Heilmann Comber, better quality, thereby saving 50 per cent. floor space, 50 per cent. power. Combs any length of staple.

Twenty-five sold to the best mills in New England within the past five months. More on order.

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DISCREPANCY IN PRINT

"One Machine Instead of Two."

The Nasmith Comber

Doubles the production of any Heilmann Comber, better quality, thereby saving 50 per cent. floor space, 50 per cent. power. Combs any length of staple.

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THE LATEST
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For Cones and Tubes.

Send for Descriptive Circular.

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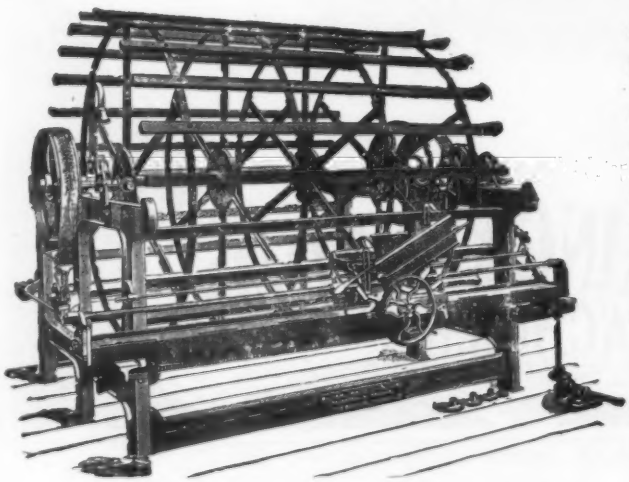
LOCKWOOD, HUDDERSFIELD.



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Makers of all descriptions of Tentering and Drying Machines.

Moore & Whiteley's Patent Wool and Cotton Dryer.

Crabbing or Winding-on Frames.

Cross Raising Machines, Wool Scouring Machines,

Hydro Extractors. Warp Sizing.

Cool Air Drying and Beaming Machines.

Warping Mills with Patent Sectional Dividing Apparatus.

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Second-hand Tentering Machines in good repair at low prices.

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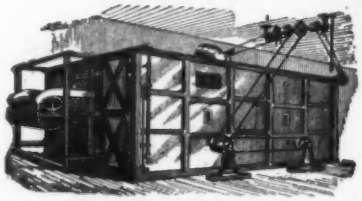
For WOOL, COTTON STOCK, YARN, STOCKINGS, UNDERWEAR, Etc.

Write for Booklets.

Truck Yarn Dryer.



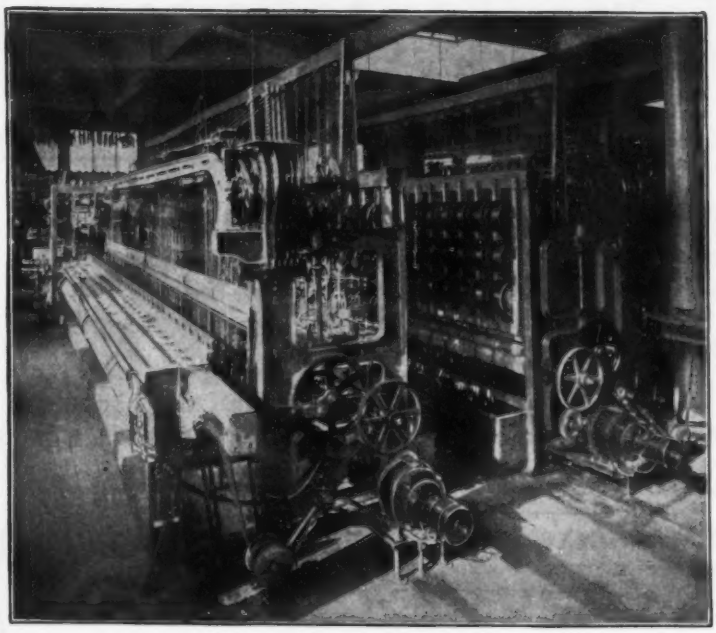
Cotton Stock and Wool Dryer.

"Hurricane" Fan, Style No. 2.

CARBONIZING, BLEACHING, OXIDIZING, CHROMING and WASHING MACHINERY.

PHILADELPHIA DRYING MACHINERY CO.

6721 Germantown Ave., Philadelphia, Pa.



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EVERY

WATSON TEXTILE MOTOR

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Insurance Policy

against loss through power wasted by belts and shafting.

THE MOST LIBERAL POLICY EVER ISSUED

Your Money Back in Three Years and a 33⅓% annual dividend thereafter.

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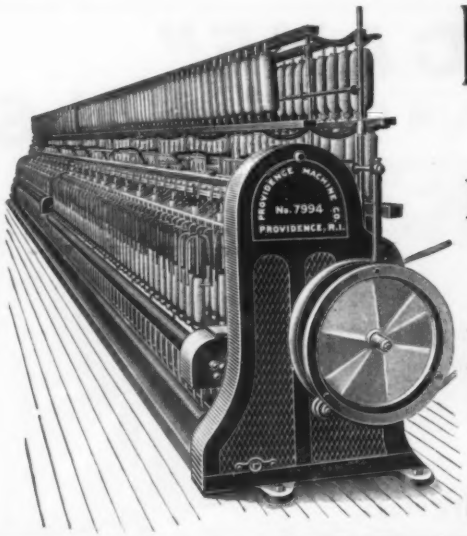

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Manufacturers of

Improved Cotton Roving Frames

Improved Worsted Roving Frames

564 Eddy St., - - PROVIDENCE, R. I.

An Essential to the Weave Room

WE ARE HEADQUARTERS

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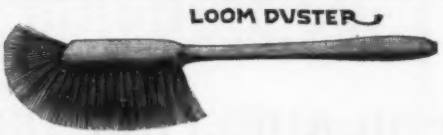

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Fairbairn Lawson Combe Barbour, Ltd.

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MAKERS OF MACHINERY FOR

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Special Machinery for the Manufacture of Twines,

ALSO OF

GOOD'S COMBINED HACKLING AND SPREADING MACHINE,

LONG REACH SCREW-GILL DRAWING FRAMES,

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PATENT HIGH-SPEED HORIZONTAL AND AUTOMATIC SPINNING FRAMES FOR MANILLA,

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Special Machinery for the manufacture of Rope Yarns and Binder Twine.

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BROWNELL'S PATENT TWISTING AND LAYING MACHINES FOR TWINE.

Complete Plans and Estimates for Flax, Tow, Hemp and Jute Mills, Trawl Twine Factories and Steam Ropeworks.

There is only **ONE**

ALBANY GREASE

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Our Special Offer.

We will send you a sample can of Albany Grease with an Albany Grease Cup, free of charge or expense, to test and prove all we claim.

The only information necessary to send is pipe connection in bearing, **depth of oil hole from top of cap to journal,** and give particular part of machinery on which the same is to be tested.

THE RESULT

CLARE, DE KALB CO., ILL., March 29, 1905.

MESSRS. ADAM COOK'S SONS, NEW YORK.

GENTLEMEN: Albany Grease Cup and sample of Albany Grease received. I will say I put the cup on the wrist pin of an engine that had always given a great deal of trouble, and from the very first use of the grease, the pin ran cool and has done so ever since although it is badly overloaded. My customer got a supply of the "Albany" of a firm in Chicago, and has used it on all of his machinery where possible ever since, and I am very certain he will make a permanent customer. One thing he told me was, he had always been prejudiced against your grease on account of its costing him considerable more per lb. than other kinds, but he had found out that it took so much less, that it really was the cheapest and then his bearings ran cool.

I have another customer who would be a convert if you care to send a cup, and he says if he keeps the cup he will pay for it, which I will remit to you. It would be about the same kind of cup only this would be a 3-8 inch shank, and the depth of hold to bearing is 15-16 inches. You would not need to go the expense of sending samples of the grease as I can get plenty here. Should you choose to send the cup please say what they are worth at retail.

Yours respectfully,

L. P. HARVEY.

Only made by

ADAM COOK'S SONS,

313 West St., NEW YORK.

"STEEL MIXTURE"
BOILER DOOR ARCHES AND FIRE BOX BLOCKS
TONGUED & GROOVED
PATENT BACK COMBUSTION CHAMBER ARCH
ARCHES MADE FOR ONE OR MORE DOOR OPENINGS
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Manufacturers of and Dealers in

WROUGHT AND CAST IRON PIPE

for steam, water and gas.

BRASS, COPPER AND LEAD PIPE.

Iron and Brass Fittings, Valves, Etc.
Iron and Brass Railing and
Awning Fittings. . .

Steam and Hot Water Heating Apparatus.

Steam Specialties, Pipe Fitters' Tools, Etc.

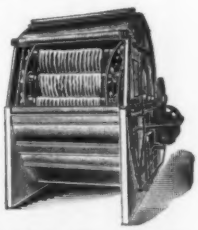
PIPE CUTTING A SPECIALTY.

SKEIN AND SLUBBING MACHINES

SAVES

75% in Labor.
30% in Winding.
Steam and Dye Stuffs.
No Friction.
No Tangling.

CAPACITY
50 to 700 lbs per batch.



THE KLAUDER-WELDON DYEING MACHINE CO.

AMSTERDAM, N. Y.

Builders of Machines

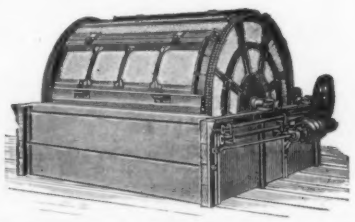
For Skein—Worsted, Slubbing, Cotton and Silk.
" " and Warp Mercerizing.
" Raw Stock Cotton, Wool, Waste and Rags.
" Garments Underwear, Hosiery and Caps
" Sulphur Colors—Raw Stock, Skein and Hosiery.

RAW WOOL AND COTTON MACHINES.

CAPACITY
200 to 1000 lbs per batch.

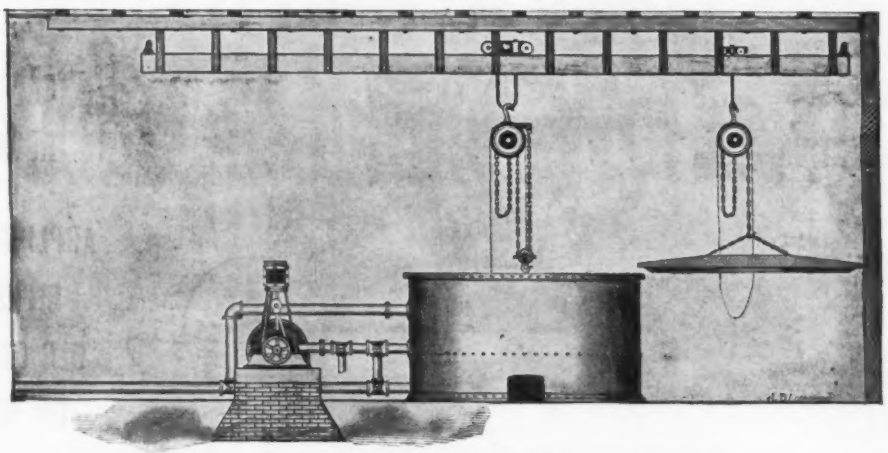
SAVES

50% in Labor besides Steam and Dye Stuffs. Practically indestructible. Leaves stock in perfect condition.



VACUUM DYEING MACHINE CO., CHATTANOOGA, TENN.

RAW STOCK, YARN AND HOSIERY DYEING MACHINES



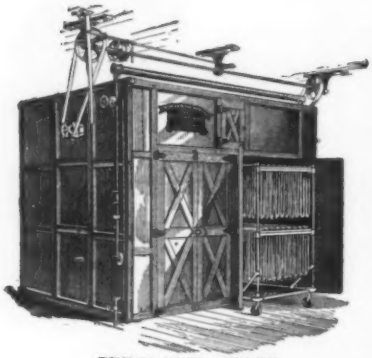
OFFICE OF TREMONT & SUFFOLK MILLS, LOWELL, MASS., Jan. 14, 1904.

VACUUM DYEING MACHINE CO., Chattanooga, Tenn.

GENTLEMEN: Replying to your inquiry in regard to what we think of your Raw Stock Dyeing Machine, would state that we have been using one about six months, with very satisfactory results, the dyeing being level, and the stock left in first-class condition for spinning. Can give your machine no better recommendation than to say, we think so well of it that we have just placed an order for two additional machines.

Yours truly J. J. CONNELL, Agent.

"20th CENTURY" MACHINERY

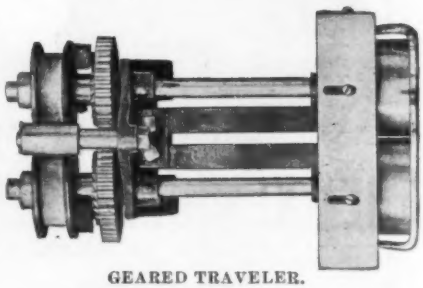


TRUCK YARN DRYER

Dryers for Wool and Cotton Stock, Yarn, Stockings and Underwear.

Carbonizers, Yarn and Wool Scouring Machines.

Ventilating Fans, Bleachers.



GEARED TRAVELER.

We also manufacture Kershaw's Geared Traveler and Improved Web Feed.

DYEING MACHINES, TOM TOMS, CHROMING, WASHING AND OXIDIZING MACHINES.

AMERICAN DRYING MACHINERY COMPANY,

19th AND WESTMORLAND STREETS, PHILADELPHIA, PA.

HENDERSON'S

Double Carding Process for Wool

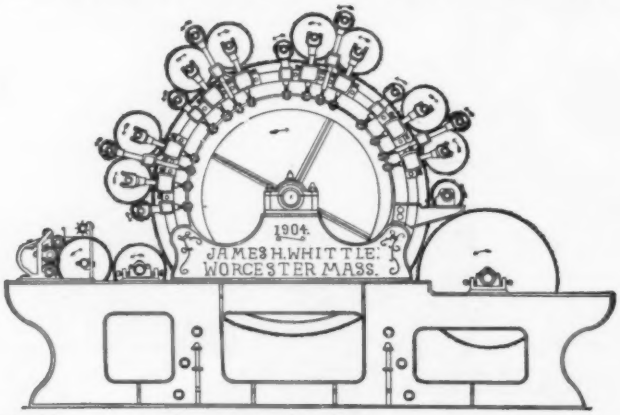
(Patented May 10, 1904)

Is a Great Success.

Manufactured By **JAMES H. WHITTLE,** 150 Harlow St., Worcester, Mass.

INCREASES PRODUCTION AND QUALITY

SAVES LABOR



SAVES ROOM

APPLIED TO EITHER OLD CARDS OR NEW

WOOL AND WORSTED MACHINERY

Including Carding Machinery for Wool and Worsted, Yarn Twisters, with or without Novelty Attachments, Yarn Dressers, Reels, Beamers, Single or Double. Yarn Spoolers, Dresser Creels, Cloth Dryers, of all widths, New Rotating Skein Dryers, Four and Eight Drum Spoolers, Improved Hydro Extractors, Improved Dusters with Fan, New Pattern Mixing Picker, Skein Drying Reels, etc.

Southern Agents: Alexander & Garsed, Charlotte, N. C.

Easy to Account For.

A smart chap recently asked us:

"You advertise that there are over 12,000 Bramwell feeders in use. Now, there are less than 8,000 sets of wool cards in the United States. What are the other 4,000 or 5,000 Bramwell feeders doing?"

They are feeding worsted cards, shoddy cards, garnett machines, burr pickers, mixing pickers, wool washers, dryers, cotton openers and other machines; in fact, wherever textile raw material, particularly wool fibres, have to be fed in regular, even quantity, and not only in the United States are they in use, but in many other manufacturing countries. There are a few mills in the United States which even yet do not use Harwood's machinery, but not many, and the number is constantly growing less.

Our specialties increase production, improve quality and decrease labor cost.

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Piece Dyeing Machines, Special Machinery,
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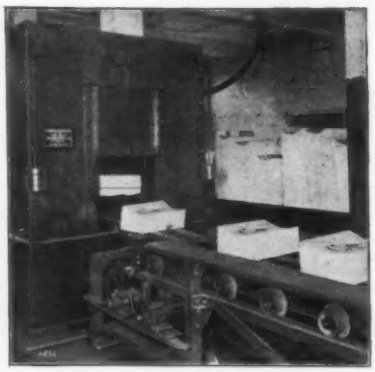


Paper-Handling Machinery

installed for Curtis Publishing Company, Phila. Handles "Saturday Evening Post" and "Ladies' Home Journal."

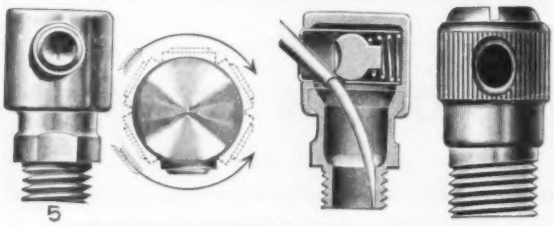
Consists of two corner hung tray elevators (one 16′ 10″ centers, the other 31′ 8″ centers) and one 76′ centers conveyor. The elevators bring papers from press rooms on third and fourth floors to mailing room on fifth floor. Each elevator unloads automatically to the conveyor, and also counts the papers automatically as they are unloaded.

Write for Link-Belt suggestions on your problem.

LINK-BELT ENGINEERING CO.

PHILADELPHIA

NEW YORK 49 DEY STREET | PITTSBURGH PARK BUILDING | CHICAGO LINK-BELT MCHY. CO.



POSTAL WILL BRING SAMPLE

A New Plant

of machines that have no protection to the oil holes leading to a bearing is not modern construction.

When ordering new equipment specify

TUCKER Dust Proof OIL CUPS

W. & C. F. TUCKER, HARTFORD, CONN.

C. G. SARGENT'S SONS,

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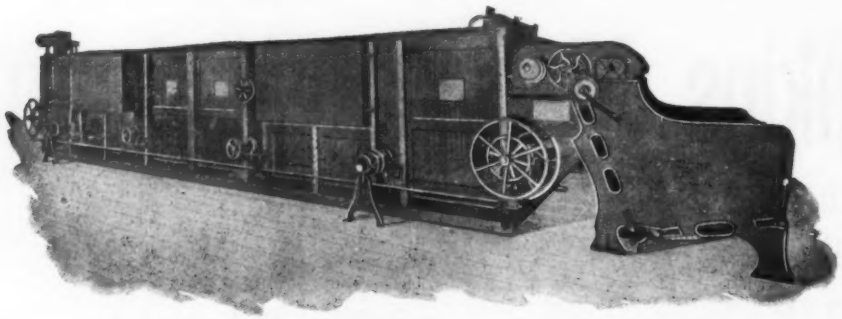


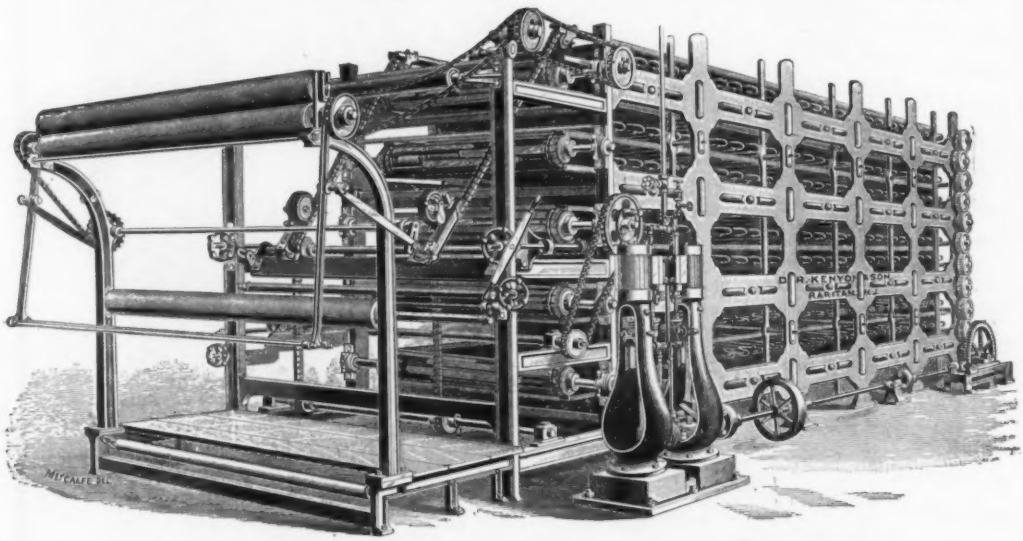
... BUILDERS OF ...

Stock Dryers, Wool Washers,
Wool Dusters, Carbonizing Plants,
Burr Pickers, Etc.

Tentering and Drying Machines

WITH LOW DOWN FEED. PATENTED FEBRUARY 26, 1895.

Tentering and Drying Machines on Pipe System. Special Dryers for Heavy Felt Goods. Hot Air Drying and Tentering Machines.



Fulling Mills, Washers, Chinchilla and Whitney Machines, Whipping Machines, Cone Willows, Marsden & Blamire Lap Feed, Dyeing Machines for Piece Goods, Soaping Machines, Wringing Machines, Jigs, (double or single,) Dewing Machines, etc.

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RODNEY HUNT MACHINE COMPANY

WATER WHEELS,
Horizontal and Vertical.
Iron Flumes and Penstocks.
Rotary Fire Pumps.
Centrifugal Pumps.
Head Gate Apparatus.
Water Wheel Regulators.
Rotary Fulling Mills.
Rotary Cloth Washers.
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and Washer for Knit Goods.
Endless Felt R'y Washers
and Rotary Felling Mills.
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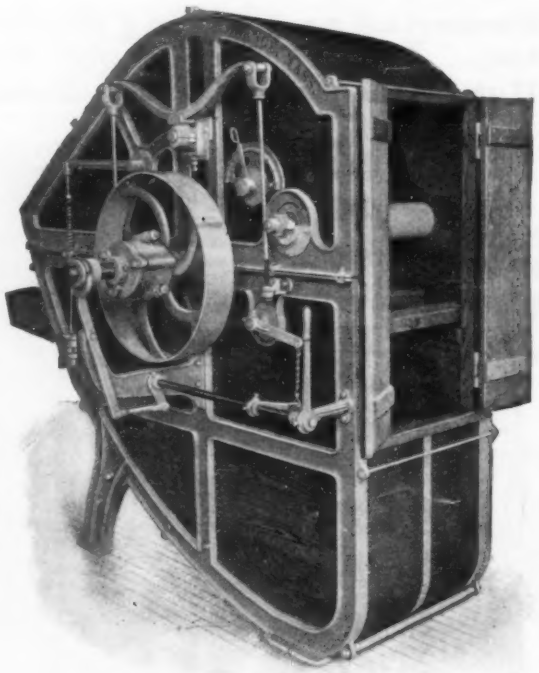
Dolly Washers.
Crank Fulling Mills.
Crank Knit Goods Washers.
Wringing and Rinsing Mchs.
Reel Dyeing Machines.
Carbonizing Machines.
Bleaching Machines for
Chloride of Lime and
Peroxide of Sodium,
Dye Tubs and Rinsers.
Wool Washers.
Soaping Machines.
Cloth Winders.

New Rotary Fulling Mill



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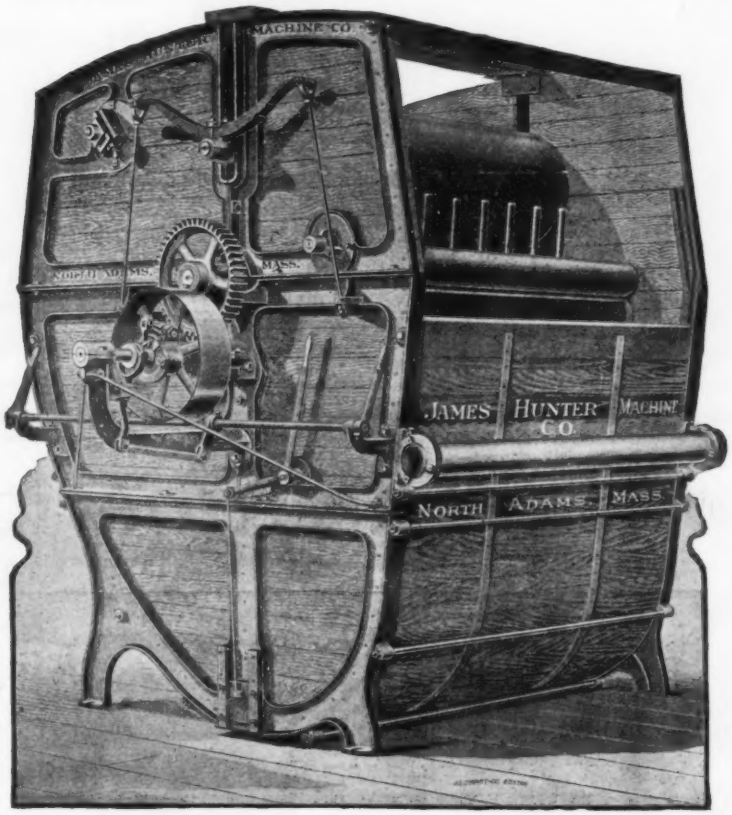
PARALLEL RAKE

The "STONE DRYER," for Wool, Cotton, Rags, Etc.

CARBONIZING MACHINERY, ETC.



Fulling Mills, Cloth Washers,

WOOL OPENERS, SELF FEEDS, DUSTERS

JAMES HUNTER MACHINE COMPANY, NORTH ADAMS, MASS.

Fabric Measuring & Packaging Co.

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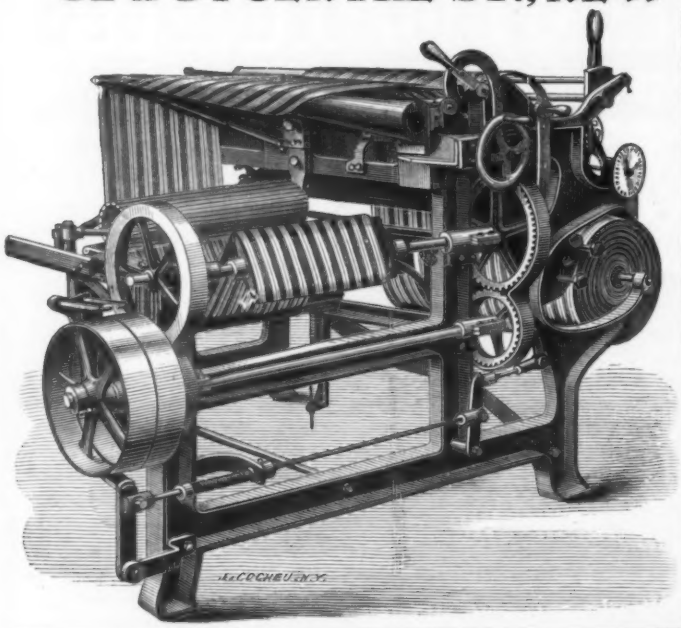

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On Cottons, Woolens and Carpets.

Machines to Measure

and imprint the measurement upon fabrics, fold lengthwise and roll into merchantable packages all in one operation.

Prevents claims for short measure.
Marks piece numbers on each package.

A Fully Equipped Machine Shop for General Work.

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It is Light, STRONG, and lasts a lifetime.
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Particularly adapted to TEXTILE manufacturing.

Sold by the Leading Supply Houses all over the WORLD.

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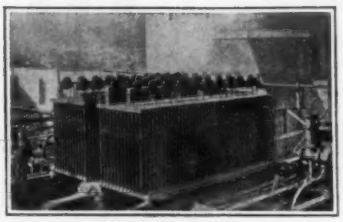
Saves 10 to 20% in Fuel.

designed for high or low pressure.

Natural or mechanical draft.



Gives 20 to 40% more steam

Prevents expansion and contraction of boilers.

Many other advantages.

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We've been very successful with installations in

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DO YOUR **BELT LACING** RIGHT—

GET A **JACKSON**

BELT-LACER

as the best equipped Textile Mills, Cotton Mills and Woolen Mills are doing—it pays to be able to lace a 5″ belt in less than 3 minutes at a cost of one cent—larger belts in proportion.— The Jackson Belt Lacer will do it—and do it in such a way that the belt can be connected or disconnected, shortened or lengthened in a few seconds. Catalog.

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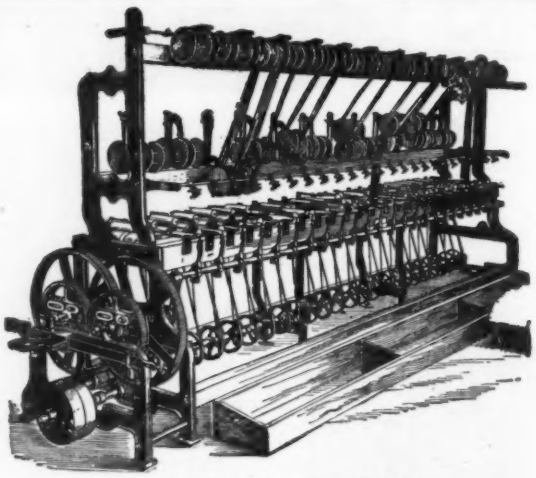
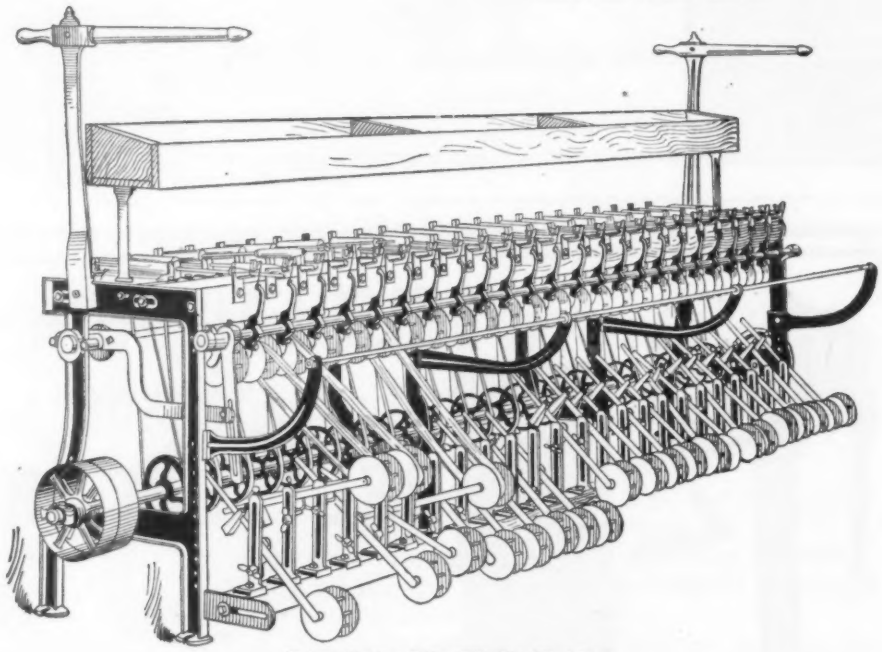
SPOOLING, WINDING, WARPING AND BEAMING MACHINERY



Patent Shuttle Bobbin Winder for Skeins, with Patent Variable Motion.



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FULL PARTICULARS ON APPLICATION.

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Mill Sewing Machines

No. 9—Portable Foot-Power Rotary Sewing Machine.

It is especially adapted for use in Cotton and Woollen Mills, Bleacheries, Print Works at the Printing Machines, in Dye Works, Cloth Rooms, at the Fulling Mill, Shears, Calendars, Gigs, Drying Machines, etc., or any of the different finishing processes in textile mills.

Manufactured by the

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FIRST CLASS MILLS USE

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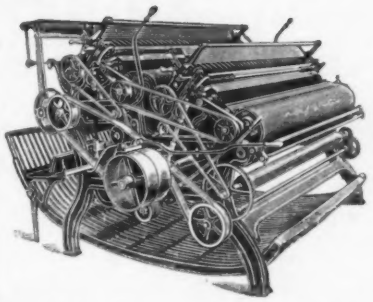

This Machine will save you

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Pays for itself

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North Chelmsford Machine & Supply Co.

Successors to Silver & Gay Co., Est. 1832.
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Manufacturer of all kinds of SPINDLES, FLYERS, RINGS, TUBES, CAPS, etc., for Cotton, Silk, Flax, Woolen and Worsted Machinery.

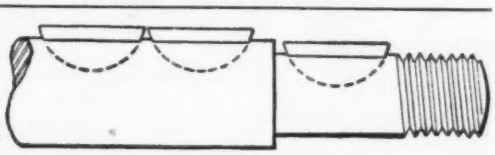
Roving Spindles and Flyers a Specialty. Light Forgings.

REPAIRING OF ALL KINDS.

Key Seating Attachment

FOR

Whiton Gear Cutter



We offer an attachment for use with our Gear Cutting Machine, to cut key seats for the Woodruff System of Keying. Write for description, circulars and price.

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NEVER SLIP COP SPINDLE

PREVENTS BROKEN COPS, SMASHES, WASTE, IMPERFECT GOODS AND ALL THE SHUTTLE TROUBLES WITH COP FILLING . . .

The illustrations explain this simple device:—
The spindle is split from the bottom to a point a short distance from the end. When in position to receive the cop, the spindle is of such a size that the cop can practically be dropped over it.
When the spindle is lowered into the shuttle the two parts forming the base are expanded holding the cop firmly in place. The pressure is sufficient to hold the cop on a smooth spindle but the corrugations at the base of the spindle hold the cop still more securely.
The spindle contracts when again raised and the empty cop is easily removed.

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Received the HIGHEST AWARD on recomendation of the FRANKLIN INSTITUTE for

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Is the largest manufacturer of HUMIDIFIERS in the World. The last twenty years receiving the HIGHEST AWARDS in this country and Europe for its AIR-MOISTENING SYSTEM. EIGHT GOLD MEDALS and others.

The Only Perfect System of Air Moistening

And Has Been Adopted by the Representative Manufacturers of this Country.

The only System adopted in the Textile Schools. Write for Booklet "T" on Humidification. Legal Proceedings will at once be taken against infringers and users of infringements.

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How to Save Comber Waste and Increase Production.

Here in New Bedford, cotton combing has been brought to a high state of perfection and we have the opportunity of studying comber questions and noting how the best results are obtained.
A marked increase in speed with more production, and yet with less waste, can be obtained by refluting the detaching rolls and putting on new top rolls of **solid** brass with **cast-steel hardened** ends or bearings.
The best mills are doing this. Try it at our expense. Send us a detaching roll. We will **reflute** it and make the new top rolls on trial.
If you are not satisfied, it will cost you nothing for our work. **But you will be.**

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We also do repair work on Flyers, New Pressers, etc.

N. B.—We have thousands of Bodden Flyers in stock. Sizes 6", 7", 8", 9" and 10". Prices way down.

Vulcan Fibre Roving Can.

BODY—Vulcanized Fibre. SIDE SEAM—Riveted with Patented Clinched Rivets. RINGS—Tinned Steel, Brazed Joints, Curled Edges. BOTTOM—IXXX. Tin Star Corrugation; Fastened without the use of nails or screws, will not crack, warp or shrink and cannot come out. FINISH—Coated inside and out with moisture proof coating, handsome and smooth. WEIGHT—About one-half pound per inch diameter. SIZE—All cans to any exact size, perfectly round and true. DURABILITY—Superior to any other can.

Also Manufacturers of

HILL'S IXXX TIN AND GALVANIZED IRON DYE HOUSE CAN.

James Hill Manufacturing Co.,

PROVIDENCE, R. I.

EVANS' FRICTION CONES.

Eight Thousand Sets in Operation in This Country and Europe.

A partial list of manufacturers who have Evans' Friction Cone Pulleys in operation, transmitting from ONE TO FORTY HORSEPOWER:

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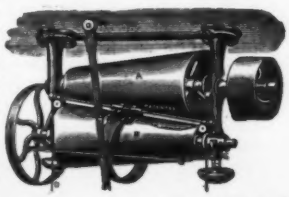
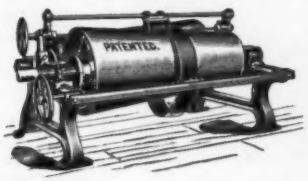
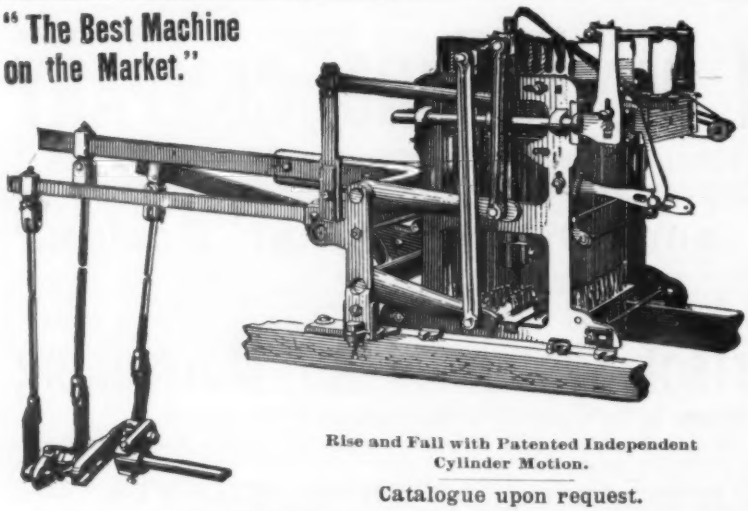




Smith & Winchester Co., So. Windham, Conn., 250 sets. Furguson & McRae, Belfast, Ireland, 25 sets. Mercantile Laundry, So. Windham, Conn., 250 sets. Washburn & Moen, Worcester, Mass., large number, all sizes. Dennison Tag Co., Boston, Mass., large number, small sizes. Saco & Pettee Machine Co., Newton, Mass., 275 sets. Pacific Mills, Lawrence, Mass., 13 sets.

Send to **G. FRANK EVANS, 1288 Center Street, Newton Center, Mass.,** for Illustrated Catalogue.

"The Best Machine on the Market."



Rise and Fall with Patented Independent Cylinder Motion.

Catalogue upon request.

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HALTON JACQUARD

Original Fine Index Machines

Single Lift, Double Lift, Double Cylinder, Rise and Fall, Crossborder.

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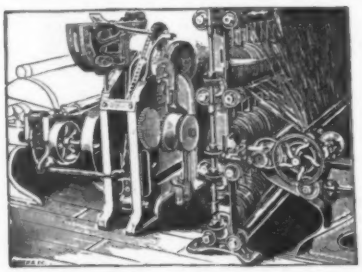

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With all the latest improvements for Wool Cards. The latest and best and only Feed that will make yarn positively even.

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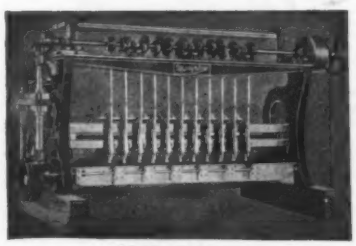

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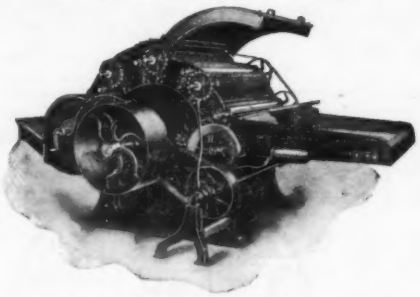

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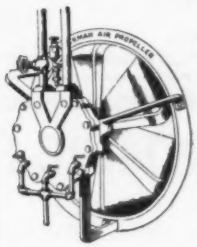

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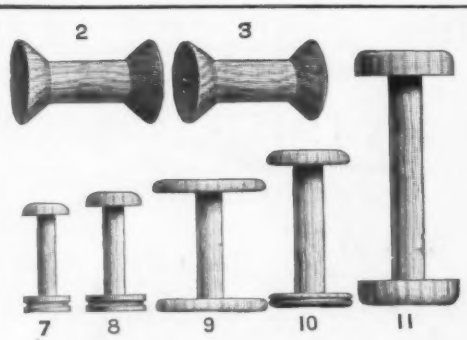

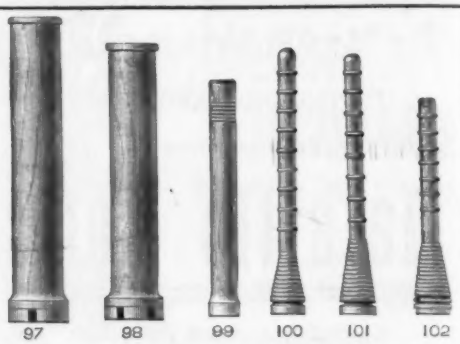

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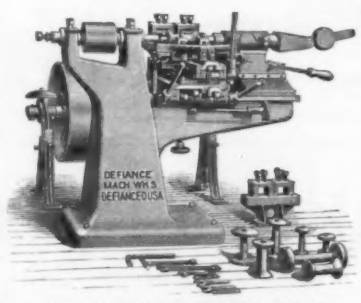

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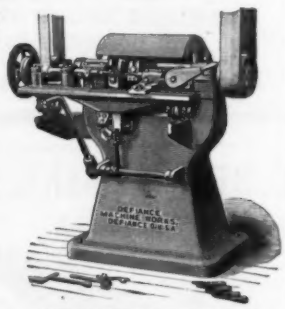

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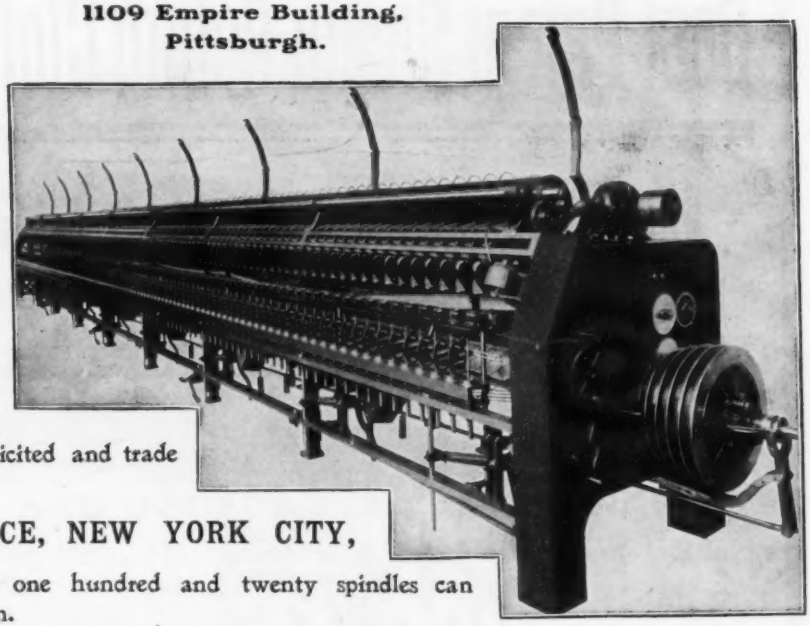

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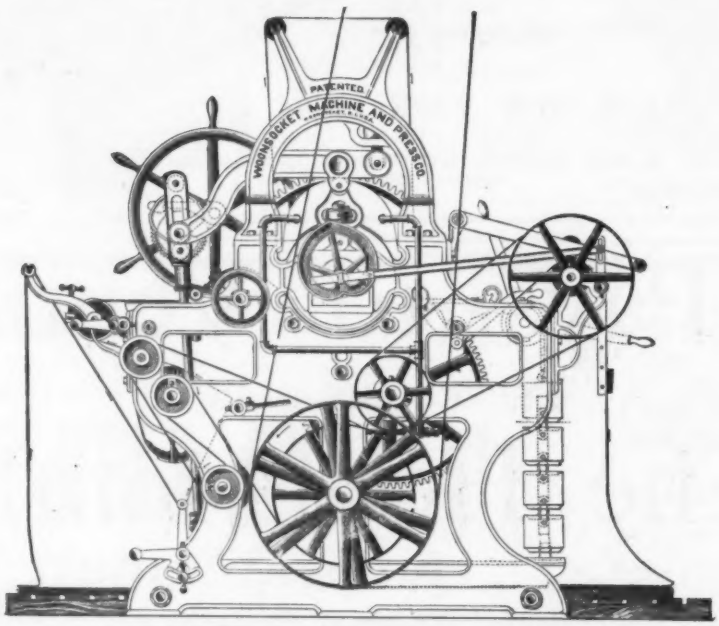

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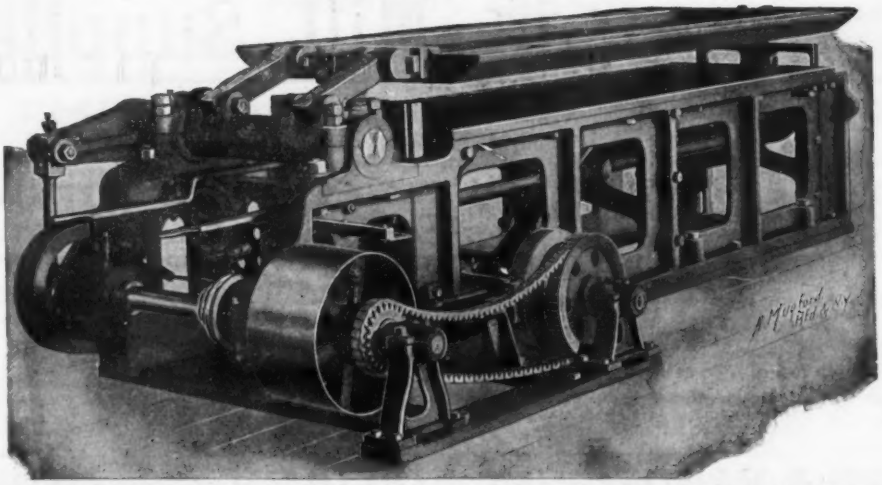

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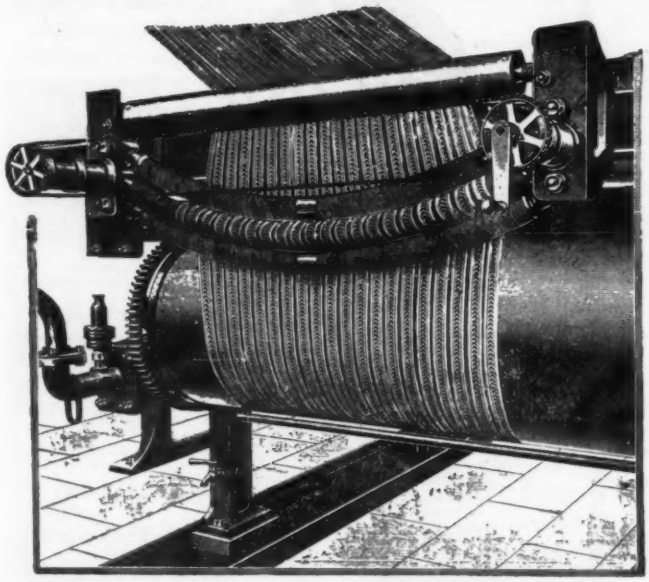

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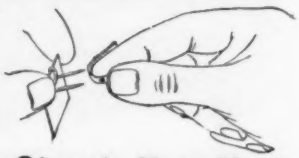

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THE CHAFFEE PATENT CLOTH BOARD,
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Will not split or warp;
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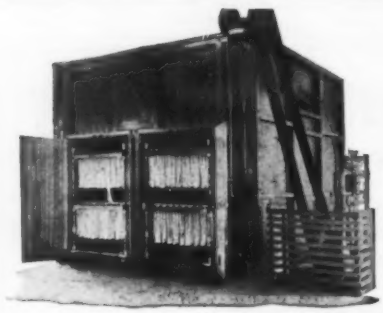

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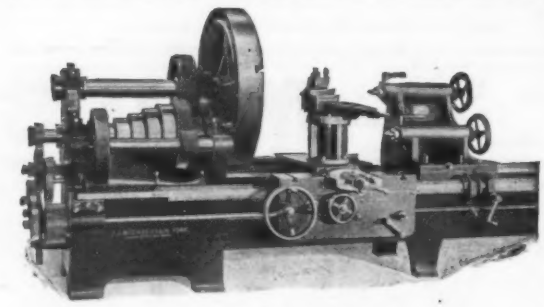

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THE BUSY-NESS LATHE

All that you can demand of 2 Lathes is given in

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and we don't demand any more than the price of one. Do you appreciate that point?

The difference in the cost is only due to the ordinary method of manufacturing, and ours.

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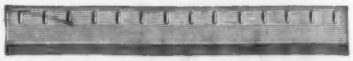
of all kinds. The oldest Cloth Shearing Knife Mfr. in Germany.
American Agents Wanted.



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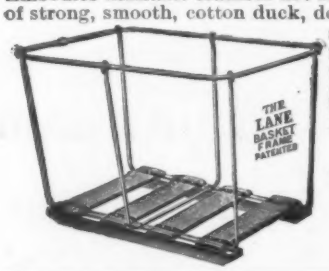

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AN INSTANT CURE FOR SLIPPING BELTS
In 1-lb. bars of convenient shape.
SAMPLE BAR FREE.
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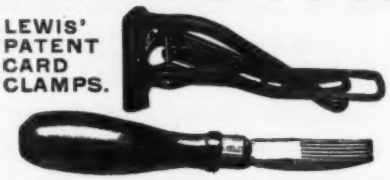
LEWIS' PATENT CARD CLAMPS.



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For Setting Up Bent Teeth of Card Clothing with a variety of all other tools used by Carders and Manufacturers.
Send for circular.

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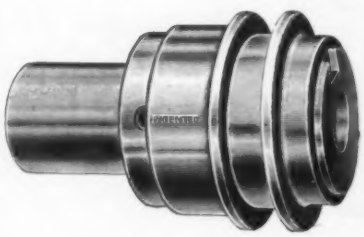
SINGLE AND DOUBLE



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They are especially adapted for Textile Machinery. Very compact, powerful and neat, having a perfectly smooth surface eliminating the possibility of accidents. They can be instantly adjusted, as required, by one screw. Operate easily and work perfectly at any speed. They are being used by many of the leading manufacturers who endorse them in the highest terms.

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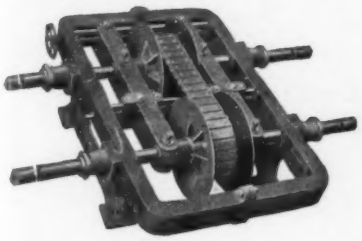

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Variable Speed Transmission

You turn the crank—it does the rest. The only transmission device of the kind on the market which is a demonstrated success.

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Also Manufacturers "THE REEVES" Wood Split Pulley

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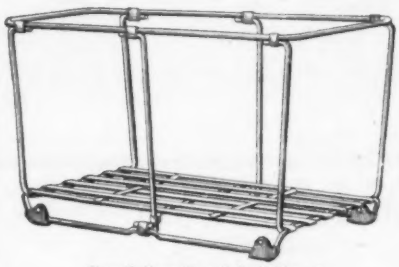
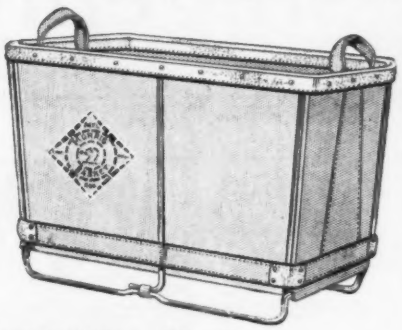
that will stand your work and not cost you much





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Reels for Cotton WOOLEN AND WORSTED

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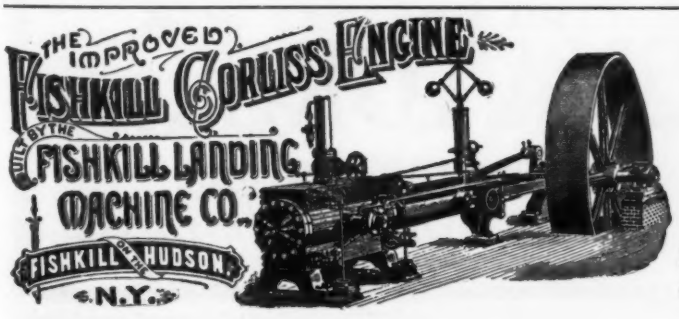

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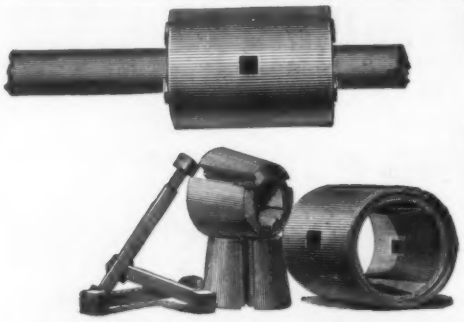

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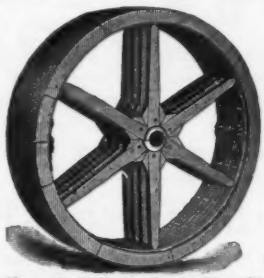

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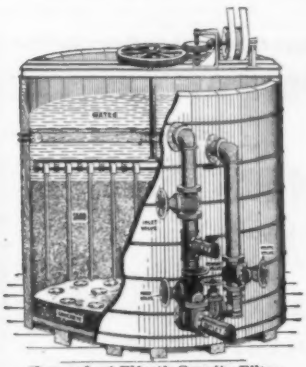

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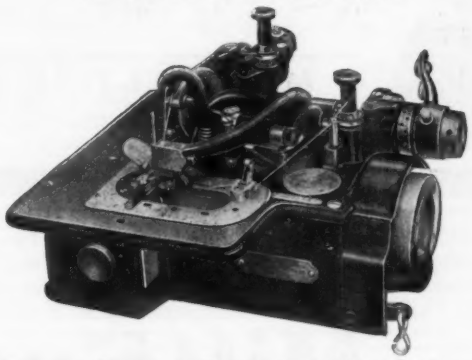

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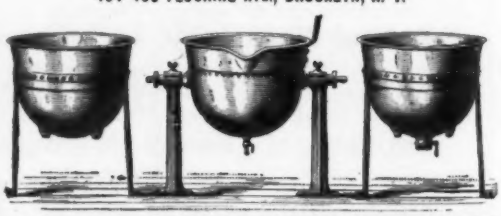

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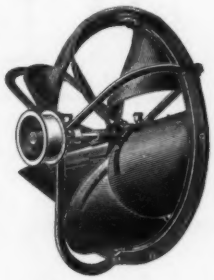

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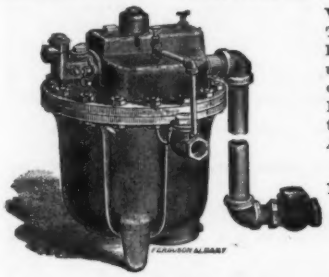

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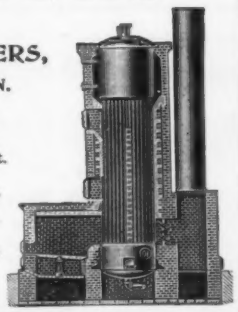

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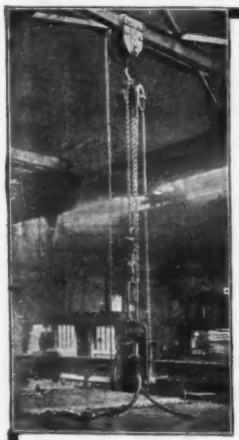

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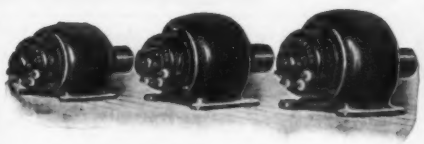

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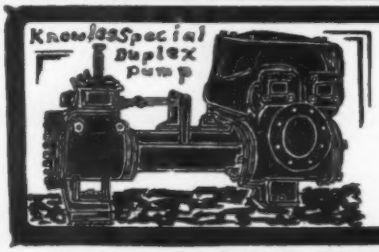

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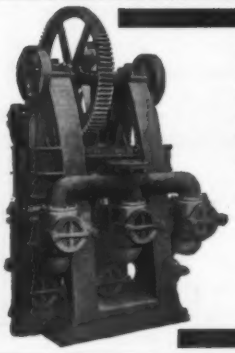

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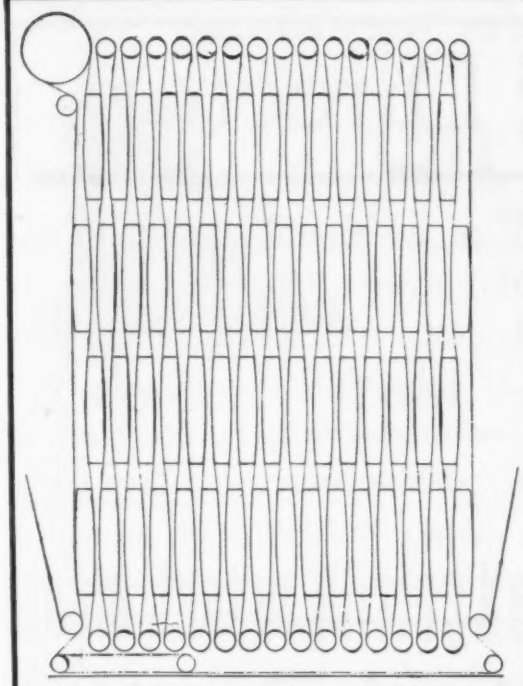

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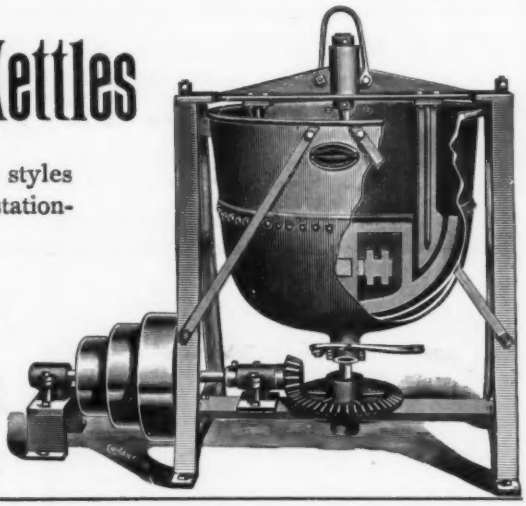

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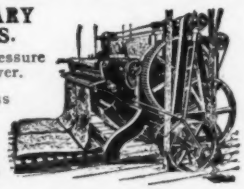

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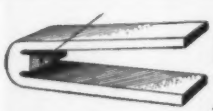

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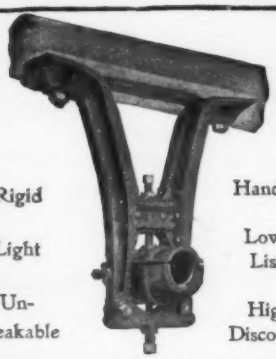

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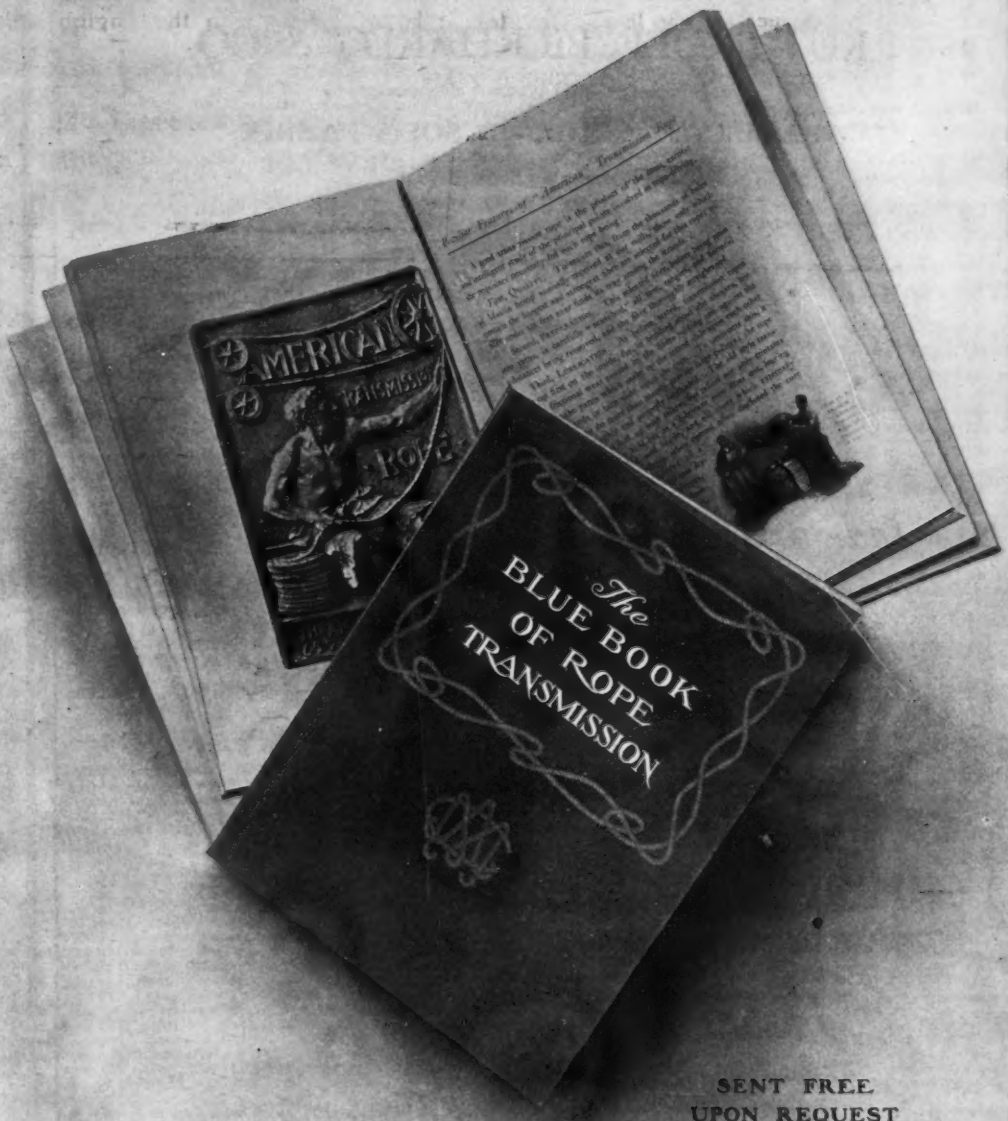

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Is published annually in the spring by LORD & NAGLE CO. It is a book of about 500 pages, well printed and bound. Office Edition $2.50. Traveler's Edition, $2.00.

PART I. Contains a complete directory of all the textile establishments in the United States and Canada. It tells what goods are made, the number of sets of cards, spindles, looms, whether and what they dye or finish, steam or water power, who the selling agents are, the names of the officers, superintendent and buyer.

There are 22 textile maps; gives population of town and railroad connections.

PART II. Is the Yarn Trade Index, containing classified lists of yarn spinners, arranged according to kind of yarn, size and number spun, etc. All the mills with worsted machinery are included in this section.

PART III. Contains classified list of mills doing order and commission work, also dyeing, finishing, bleaching and printing establishments, classified according to the kind of work done, and so far as possible giving width of goods handled; also shoddy, extract and flock manufacturers and wool scouring establishments.

PART IV. Manufacturer's Selling Agents and Dry Goods Commission Merchants, giving the name and address of concern, character of goods handled, different departments, with managers, list of manufacturing clothiers, and suit and cloak manufacturers, giving specialties and buyers names. A list of city offices of textile mills is given.

PART V. Dealers and Brokers in raw materials and stock, including wool and shoddy dealers and brokers, cotton dealers and brokers, factors and buyers and wholesale rag dealers making a specialty of textile interests.

PART VI. Buyers Index of Textile Machinery and Supplies, and statistics showing textile machinery in the United States, giving spindles, looms, knitting machines, etc.

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Is published early each year by LORD & NAGLE CO. It is a complete directory of all the establishments in the United States and Canada manufacturing knit goods. It gives the location of the mill, the capital stock, names of the officers, superintendent and buyer, class of goods made, the machinery, including number of knitting machines and sewing machines, selling agents, if any, and in most cases the class of yarn bought. It also contains a list of commission houses making a specialty of knit goods, and jobbers and large retailers having knit goods department, in most cases giving the names of manager in charge of knit goods. The book is small so that it may be carried in the pocket. Price is $1.00.

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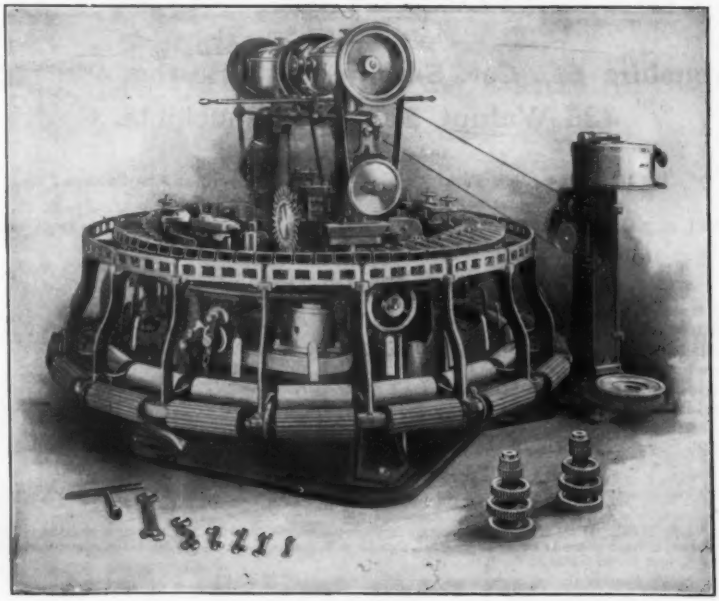

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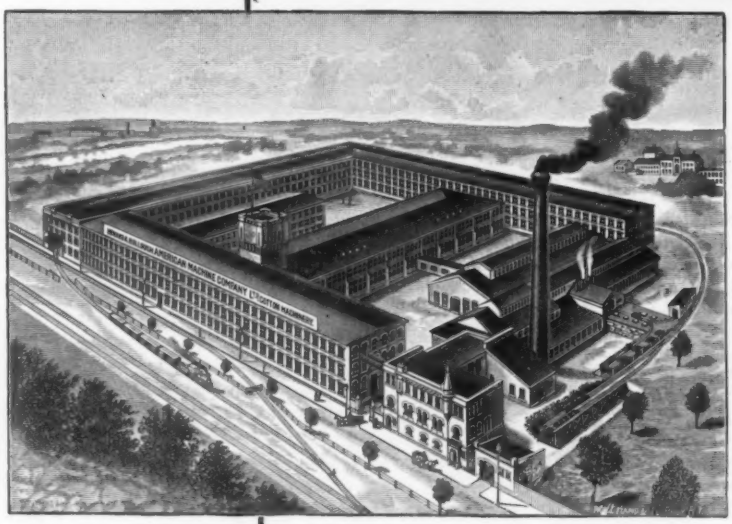

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VOL. 29. (NEW SERIES.) JUNE, 1905 No. 3.

Monthly Comment.

Fall River Wages.

The strike of the cotton mill operatives at Fall River begun last July against a reduction in wages of 12 1/2 per cent. ended in January with the understanding that the operatives should resume work at the reduction and that Gov. Douglas should "investigate the matter of margins and submit his conclusions as to what average margin shall prevail on which the manufacturers shall pay a dividend of 5 per cent. on wages from the present time to April 1, 1905." The governor's decision, announced last month, is as follows:

"At the close of the strike in Fall River, in January last, I agreed to investigate the matter of margins, and submit my conclusions as to what average margin should prevail, on which the manufacturers should pay a dividend of five per cent. (5 per cent.) on wages earned from that time to April 1, 1905. In accordance therewith, I herewith submit to you my conclusions.

"After April 1, 1905, I began investigations by submitting to such of the corporations as were affected by the strike a list of ten (10) questions to be answered by them, and certified under the hand of the treasurer of the respective corporations. The questions were prepared by Mr. Charles F. Pidgin, chief of the Massachusetts Bureau of Statistics of Labor, whose assistance throughout the investigation has been of great value to me, and were carefully examined by me before they were submitted to the corporations affected. They were as follows:

"1. Cost per spindle (present valuation).

"2. Percentage of cost required for dividends.

"3. Percentage of cost required for depreciation.

"4. Pieces of cloth produced by 50,000 spindles in one week (averaged for ten weeks).

"5. Pounds of cloth produced by 50,000 spindles in 51 weeks, equivalent to units of 45 yards 64 by 64 print cloths.

"6. Running expenses exclusive of cotton—one week.

"7. Average price of middling uplands cotton per pound from Jan. 20, 1905, to April 1, 1905.

"8. Number of pounds of cotton required to make 45 yards of cloth (width in inches) (Pick).

"9. Average selling price for cloth per yard between Jan. 20, 1905, and April 1, 1905.

"10. Amount received for waste and by-products, per week.

"Nineteen corporations, including nine of the ten specified by the employes, made answer to my inquiries. I have satisfied myself as to the correctness of the figures given me by the mills, and from these returns and other sources, I find the following facts, using as a basis of computation cotton cloth, 28 inches wide, 64 by 64 pick:

"The average price of Middling Uplands cotton per pound from Jan. 20, 1905, to April 1, 1905:

"The average selling price for cloth per yard between Jan. 20, 1905, and April 1, 1905:

"The average running expenses, exclusive of cotton, per week, less an average amount received each week for waste and by-products:

"The capitalization of the various mills:

"Allowing six per cent. for annual dividends and five per cent. for annual depreciation, I find that it will require a margin of seventy-four and thirty-eight one hundredths cents between the price of forty-five yards of cloth and eight pounds of cotton to pay a dividend of five per cent. on the wages earned during the time specified. It is claimed by the employes that in submitting my conclusion, I should take into consideration the fact that the mills have not been running full during the time specified, and have otherwise been prevented, on account of the previous strike, from making as good a showing as they otherwise would. It is undoubtedly true that the showing made by the

mills during the time specified is for the reasons claimed by the men less than it would have been under ordinary circumstances, but I do not see that under my agreement with both parties, I am allowed to consider these facts, and I have accordingly omitted them from my calculations."

The 12 1/2 per cent. reduction last January brought the weaver's price list to 17.32 cents per cut. At that time cotton was selling for 7 cents and regular print cloths for 2 3/4 cents, making the margin 67.8. Since that settlement cotton has advanced to 8.15 cents, while print cloths have remained practically stationary. This has resulted in a reduction of the margin and consequently the Governor's decision that the margin must reach 74.38 to warrant an advance of wages from 17.32 per cut is against any increase. In this connection it will be interesting to examine the course of wages, cotton and cotton goods prices and margins for the past twenty years at Fall River.

	Weaving	Cotton	Cloth	Margin
Feb. 4, 1884	18.50	10 12/16	3 10/16	77.
Jan. 19, 1885	16.50	11 1/16	3 3/16	55.
Mar. 1, 1886	18.15	8 15/16	3 3/16	72.
Feb. 13, 1888	19.00	10 10/16	4	95.
Jul. 11, 1892	19.60	7 15/16	3 6/16	94.
Dec. 5, 1892	21.00	9 9/16	4 1/16	107.
Sep. 11, 1893	18.00	7 3/16	2 12/16	66.
Aug. 30, 1894	16.00	6 15/16	2 10/16	63.
Apr. 22, 1895	18.00	6 15/16	2 12/16	68.
Jan. 1, 1898	16.00	5 14/16	2 4/16	54.
Feb. 27, 1899	18.00	6 8/16	2 12/16	71.75
Dec. 11, 1899	19.80	7 11/16	3 4/16	84.50
Mar. 17, 1902	21.78	9 2/16	3	59.
Nov. 23, 1903	19.80	11 4/16	3 4/16	56.
Jul. 25, 1904	19.80	11 4/16	3 2/16	50.6
Jan. 1, 1905	19.80	7	2 12/16	67.8
May 12, 1905	17.32	8.15	2 21/32	54.3

In considering this question of wages and margins it should be borne in mind that the 45 yard basis on which the above list has been compiled and which was adopted by Gov. Douglas has for many years been unsuited for conditions in the Fall River mills. When first adopted the mills were making print cloths almost entirely and the difference between the selling price of 45 yards of such goods and the cost of 8 lbs. of middling uplands cotton was a fair standard by which to judge of the returns of manufacturing. The increasing diversity of goods made in the mills led to the substitution of 22 1/2 yards of regular and 16.36 yards of wide print cloths for the 45 yards of regular goods. Even this new basis proved unsatisfactory for the diversified production of the mills and has been practically abandoned, both methods being used in general discussions of the wage question because no better standard was available. The use of the first one by Gov. Douglas was doubtless due to that fact, and it is not likely that either will in future be adopted in settling disputes between the Fall River mill owners and their employes.

Large Imports of Wool.

During the nine months ending March, 1905, the wool imported into the United States exceeded the quantity for any similar period under a tariff on wool. The increase as compared with the nine months ending March, 1904, is shown by the following table:

	1904.	1905.		
Class 1, lbs.	20,899,037	61,323,747	40,424,710	Inc.
" 2, lbs.	9,211,780	22,569,734	13,357,948	Inc.
" 3, lbs.	85,868,140	83,829,481	2,038,659	Dec.
	115,978,963	167,722,902	51,743,999	Inc.

At the above rate for 1905 the year's imports would reach 223,630,616 lbs.

The imports of woolen goods for the nine months ending March, 1905, amounted to $13,704,811, showing a slight decrease as compared with the corresponding period of the preceding year, and a total for the year of $18,273,081. At three pounds of grease wool for each dollar's worth of goods this is equivalent to 54,819,243 lbs. of wool, which, added to the 223,630,616 lbs. imported in the raw state, gives a total of 278,449,859 pounds of grease wool as the equivalent of both raw wool and manufactured goods imported per year. Allowing for a loss of 30 per cent. in scouring the clean weight, 195,000,000 lbs. The best estimate of the domestic clip gives the clean weight at 130,000,000 lbs., making a total of 325,000,000 lbs. of clean wool entered for consumption during the current year. On this basis the wool consumed in the United States at the present time amounts to 4 pounds per capita, scoured weight, of which 40 per cent. is domestic and 60 per cent. foreign.

Special Training for Consular and Commercial Agents.

At the recent convention of the American Cotton Manufacturers' Association held at Knoxville several resolutions were unanimously adopted looking toward the establishment of a College of Commerce for the education of American consuls and commercial agents. The United States consular service, which is distinctly commercial rather than diplomatic in its functions, has in past years been considered from the standpoint of party spoils rather than with a view for the advancement of commercial interests. In spite of these adverse conditions many of the United States consuls are men of broad education with a thorough appreciation of the needs of American manufacturers and are of the greatest possible service to them. The full value which our consular service can be to our commercial and manufacturing interests is just beginning to be recognized and anything which tends to its improvement should be encouraged.

As a natural sequence of Government training, the consular service would be removed from the uncertainty of political changes and become like the army and navy a branch of the Government service which would offer a recognized and permanent business career.

With a view of advancing the export trade in cotton goods the Association resolved that the following committee of three should be appointed to collect data which would be of interest to the trade and develop the export of fancy goods: Arthur Amory, Boston; George B. Hiss, Charlotte, N. C., and Wm. Whittam, Jr., Charlotte, N. C. The same committee, with the addition of E. Ashcrafte and John E. Carey of Lockport, N. C., has been appointed to act with the committee from the Southern Cotton Association on the subject of formulating some plan for the extension of foreign markets for cotton goods.

There are four varieties of artificial silk; one of them, pyroxylin silk, is made of a solution of guncotton in a mixture of alcohol and ether.

A Law Against Grafters.

Rhode Island has followed the lead of Massachusetts in enacting a law to prevent the bribery of employes by dealers who are selling goods to the employer. The Massachusetts law was passed about a year ago. The text of the Rhode Island statute is as follows:

"No agent, employe or servant in public or private employ shall corruptly accept, or obtain, or agree to accept, or attempt to obtain, from any person, for himself or for any other person, any gift or valuable consideration as an inducement or reward for doing or forbearing to do, or for having done or forborne to do, any act in relation to the business of his principal, master or employer, or for showing or forbearing to show favor or disfavor to any person in relation to the business of his principal, master or employer.

"No person shall corruptly give or offer any gift or valuable consideration to any such agent, employe or servant as an inducement or reward for doing or forbearing to do, or for having done or forborne to do, any act in relation to the business of his principal, master or employer, or for showing or forbearing to show favor or disfavor to any person in relation to the business of his principal, master or employer.

"No person shall knowingly give to any such agent, employe or servant any receipt, account or other document in respect of which the principal, master or employer is interested which contains any statement which is false or erroneous or defective in any important particular, and which to his knowledge is intended to mislead the principal, master or employer.

"Any person who violates any of the provisions of this act shall be deemed guilty of a misdemeanor, and shall, on conviction thereof, be imprisoned, with or without hard labor, for a term not exceeding one year, or be fined not exceeding $1,000.

"Any person injured by any violation of the provisions of section 1 may recover from the person or persons inflicting such injury twice the amount of such injury.

"No person shall be excused from attending and testifying or from producing papers, contracts, agreements and documents before any court which may be determined to be evidence in such case, or in obedience to the subpoena of any court having jurisdiction of the misdemeanor on the ground or for the reason that the testimony or evidence, documentary or otherwise required by him may tend to incriminate him or subject him to a penalty or forfeiture. But no person shall be prosecuted or subjected to any penalty or forfeiture for or on account of any transaction, matter or thing concerning which he may testify or produce evidence, documentary or otherwise, before said court or in obedience to its subpoena or in any such case or proceedings."

The Southern Hosiery Manufacturers' Meeting.

It had been expected that following so closely the meeting of the American Cotton Manufacturers' Association there would be a large attendance at the annual convention of the Southern Association of Hosiery Manufacturers which was scheduled for May 12 at Knoxville. Whether it was overshadowed by the larger meeting or whether in the general satisfactory condition of business hosiery manufacturers were too busy to attend conventions, the attendance was smaller than usual and it was decided to hold over the reading of the papers and the reports of the committees until the fall meeting.

Vice president Garnett Andrews of Chattanooga occupied the chair owing to the unavoidable absence of President J. S. Carr, Jr. Although it was the unanimous wish of those present, Mr. Andrews was obliged for personal reasons to decline the nomination for president of the ensuing year. He nominated Harold Lamb of the Union Manufacturing Co., Union Point, Ga., for that office, who was elected, together with the following officers: first vice president, J. F. Cannon, Albemarle, N. C.; second vice president, J. M. Jones, Jr., Sweetwater, Tenn., secretary and treasurer; J. M. McPhail, Nashville Hosiery Mills Co., Nashville, Tenn.

The present committees were continued for the coming year and the choice of place and time for the fall meeting was left in the hands of the president and secretary. An earnest effort will be made to ensure a full attendance.

New Factory Law in Pennsylvania.

One by one the manufacturing states are taking steps toward improvement in the conditions of child labor. A new law recently passed by the Pennsylvania legislature increases the age limit from thirteen to fourteen years, but by reason of the stringency of the conditions in regard to the employment certificates it is expected to bar out many children under the former age limit who had been able to secure a certificate from a notary public on the affidavit of their parents. The new law requires that employment certificates are to be issued by the principals of schools, factory inspectors or teachers in districts where there are no superintendents. No change is made in the hours per day or per week. Children of fourteen years may still be employed 10 hours per day and 60 hours per week.

Manufacturers interested in the changes can procure from the office of the factory inspector the text of the new law and a copy of the certificate which children will be required to obtain and which must be on file in the manufacturer's office during the term of employment.

International Congress of Cotton Spinners and Manufacturers.

As this issue of tne Textile World Record is in press the Second International Congress of Cotton Spinners' and Manufacturers' Associations of the World is being held in Manchester, England. This important gathering will be largely attended by cotton spinners and manufacturers of Great Britain and the Continent of Europe and the proceedings will be of much interest.

The editor of this magazine sailed for Europe in May to attend the Congress and make an extended tour through the manufacturing districts of Great Britain and the Continent. We expect to present an account of the important features of the Congress in the next issue.

Silk Wound on Bobbins Must Pay Duty.

The United States circuit court of appeals confirmed the decision of the lower court in the test case of Klotz & Co. When the silk in controversy was entered the collector of customs took the view that as it was reeled on cops instead of being in skeins it was "advanced in manufacture" in the sense contemplated by the Dingley tariff, and a duty of 40 cents per pound was levied. This was paid under protest by the importer and an appeal taken. This decision sustained the Treasury Department and fulfils the hopes of the domestic throwsters who feared the entry of silk wound on cops or bobbins would have the effect of destroying that branch of the silk industry in the United States.

Cotton and Cotton Goods for Export.

By reason of a decrease of nearly three cents in the price of cotton the United States supplied foreign countries with 3,396,780,333 lbs. cotton in the nine months ending March, 1905, and received $23,702,886 less for it than for 2,756,663,548 lbs. exported during the nine months of the previous year. The cotton exports for the nine months ending March for each of the past three years are as follows:

	Pounds.	Total value.	Per pound.
1903	3,203,492,648	$280,150,519	8.74 cts.
1904	2,756,663,548	329,304,108	11.95 cts.
1905	3,396,780,333	305,601,222	9.00 cts.

The exports of cotton goods in the nine months ending March, 1905, were the largest on record, amounting to 479,327,920 yards, valued at $27,700,173. This is at the rate of 639,103,893 yards, valued at $36,933,564 per year, an amount far in excess of the cotton goods exports for any previous year. To this must be added the exports of cotton goods other than cloth, which brings the yearly estimate to $43,768,012. The best previous year was 1902 when the cotton goods exports of all kinds were valued at $31,300,000.

For the nine months just closing the countries taking less goods from us than in 1904 were British Africa, Oceania, British East Indies, Venezuela, Brazil and Canada. The increase in the nine months' business was due principally to the larger purchases by the countries named in the following list, which also gives the yardage for each year:

	1904	1905
China	62,365,497 yds.	321,993,239 yds.
Japan	170,756 yds.	10,983,487 yds.
Philippines	3,572,410 yds.	12,184,744 yds.
Cuba	2,902,841 yds.	11,310,030 yds.

The sudden increase from an insignificant business with Japan to 10,983,487 yards was unquestionably due to the war with Russia, which created a pressing need for cotton goods. This demand will probably end with the war. In the case of China, Cuba and the Philippines, the growth is of a more stable character and, consequently, more gratifying. The increase of exports to Cuba is due in some measure to the reciprocity treaty under which American cottons are admitted at a reduction of 30 per cent. The change of policy on the part of American manufacturers is also operating to swell the exports of cotton goods. A few years ago the export business was a side issue with all but a very few mills. Now, however, it is becoming a specialty with an increasing number. The special requirements of the foreign market are studied and efforts are made to hold the trade instead of making it subordinate to the domestic trade.

Sericulture.

Two years ago the possibility of raising raw silk in the United States to supply domestic mills which are now supplied entirely from foreign sources, claimed a large share of attention in the press. Congress was induced to make an appropriation for experiments in domestic sericulture and a company was formed to establish the new industry on a commercial basis in the Southern States. The annual imports of silk in 1903 were valued at $43,135,197; in 1904, at $54,879,276, so that the proposition possessed great theoretical possibilities. The objections raised to the plan were based chiefly on the low cost of the highly skilled labor engaged in the production of silk in China and Japan, which makes it impossible for the industry to be successful in this country. In considering this question we were impressed with the absence of reliable data regarding the cost of sericulture and the technical conditions in the industry in those countries from which we obtained our supplies. To remedy this difficulty we asked Mr. O. P. Austin, Chief of Bureau of Statistics at Washington to have our consuls make an investigation of the subject. This suggestion was adopted and as the inquiry involved many technical problems the department obtained the assistance of Mr. Franklin Allen, of the Silk Association of America in preparing a series of questions, which were submitted to the consuls for their guidance. The consular reports in response

to this request have just been issued and the detailed information they contain amply compensates for the delay of nearly two years. They are too long to be given in full here, but the following extracts give the particulars regarding wages and hours of labor, which have the most important bearing on the question of raising silk in America.

ITALY.

Vice-Consul Smith, Milan:

A family's work and its results.—As already stated, the raising of the silkworm is undertaken by the peasant's family. It is not the special work of one person. A family comprising father, mother, and four children, males or females, two of whom are over nine years of age, cultivate on an average, 30 to 40 grams (1 to 1 1/3 ounces) of seed. The father with the male children gather the leaves from the trees. During the first fifteen days of cultivation the father gives, progressively, one to four hours of his daily time to this work, and four to twelve hours, always progressively, for the next fifteen days. The wife is occupied feeding the worms and chopping the leaves, according to the age of the worms. During the first fifteen days this work requires from two to eight hours of the twenty-four, feeding having to be done at regular intervals days and night. During the following fifteen days the woman works from eight to eighteen hours during the twenty-four. The last eight days of the raising period (which is comprised in the thirty days) require the whole attention of the man and wife, with the help of the two eldest children. When the worms have sought the twigs, specially prepared and ready for them, to spin the cocoon there are eight to ten days of repose. Then follow another day and a half's work devoted to collecting the cocoons.

Yearly compensation.—Generally speaking, the women engaged in reeling the cocoons have no other occupation, and it can therefore be estimated that they earn from 250 to 300 lire ($48.25 to $57.90) a year. In a filature of 100 basins, the manager earns from 3,000 to 4,000 lire ($579 to $772) a year, plus houseroom for his family. The bookkeeper earns 1,000 to 1,500 lire ($193 to $279.50) a year. Three or four overseers (women) are paid from 2 to 3 lire each (38.6 to 57.9 cents) per working day.

CHINA.

Consul-General Wilcox, Hankan:

Persons engaged.—A large percentage of the farming class in the provinces of Hupeh, Hunan, and Szechuan is engaged more or less in raising silkworms. The women look after them and seem to consider it more of a pastime than work and an easy way to add to the limited resources of their families. They do it somewhat as American farmers' wives sell butter and raise chickens and eggs to a limited extent for the market. They raise a few pounds of cocoons and reel the silk on an old-fashioned spinning wheel, and sell their year's produce of silk to the merchant. It often amounts only to from $1 to $5, the product of from 1,700 to 8,500 cocoons. This class produces in the aggregate the majority of the reeled silk in these provinces.

Number of operatives and wages for reeling.—There is only one silk filature in this consular district, and that is owned in part by the viceroy and is located at Wuchang. There are 400 women and girls employed. The women and older girls receive from 5 to 10 cents gold per day as reelers. The younger girls, who are called scalders and attend to the cocoons in the hot water and carry them to the reelers, receive about 2 1/2 to 3 cents per day for eleven hours' work.

Seasons and hours of work.—The number of days the filature runs depends upon the amount of orders for silk and the supply of cocoons; if there is a sufficiency of both the filature runs for about nine months in the year. During the hot days of July and August it works only from 6 a. m. until noon, and during the fourth moon it stops work for twenty days to buy cocoons from the surrounding districts. The 1st and 15th days of each month are holidays, and the employes also take several days off at the Chinese New Year.

The work begins at 6 a. m. and continues to 6 p. m., with an intermission at noon of one hour. If any of the operatives are not punctual they are fined.

Consul Anderson, Haugchau:

It is difficult to get any intelligent idea of the division of duties in raising the cocoons: Little or nothing is done in the way of scientific examination of the moth, little discrimination is exercised in the care of the seed, and there is but a general method of caring for the cocoons. The whole family does it all. Probably it may be said that in a family which produces from 100 to 140 pounds of cocoons the careful attention of two persons for forty days is devoted to the work. The first of these persons will get $6 or $7 Mexican ($2.75 to $3.10 gold) and the second $4 or $5 Mexican ($1.80 to $2.25 gold). The return is represented by the production rather than by any wage scale, even where the cocoons are raised for some one else.

There are three grades or chops of silk produced in this part of China. On the basis of 1,000 taels a picul ($700 gold for 133 pounds) for the first grade, the two others will be valued at about $686 and $672 gold per picul. In the filatures the best operators receive 50 cents Mexican per day (22 1/2 cents gold). The best reeler will reel perhaps 14 Chinese ounces (18 1/2 American ounces) a day. The general run of reelers, however, will turn out from 11 to 14 American ounces, and for this will receive from 13 to 18 cents gold per day as high wages. It is doubtful if the average will be over 13 American ounces, with an average pay of 13 cents. There are Chinese children employed in the filature who are paid 4 or 5 cents gold per day. It is probable that an estimate of a cent gold per American ounce of silk is not far from the pay for reeling. As a rule there is no difference between the pay of men and women for equal work. Hours of labor are fixed by custom at about ten, but it is to be considered in discussing Chinese labor matters that the Chinese do not work as steadily as men of most other nations, though they work longer.

JAPAN.

Consul-General Bellows, Yokohama:

Wages and output.—Women employed to care

for silkworms receive 10 cents a day and board, and men engaged in the same work receive 15 cents a day and board. The employment of children for wages is not mentioned in the published reports. There are three cocoon crops per year, and each requires from thirty to forty days' work. The conditions of the work are too variable to permit of any statement regarding the average number of hours of labor per day.

The average number of cocoons attended by each

Crop.	Cards of worms, *a*	Cocoons.	Raw Silk.
	Number.	Bushels.	Pounds.
Spring crop	1.7	5,960	10,000
Summer crop	1.2	3,215	5,400
Autumn crop	1.5	4,059	6,800

a Average number of worms to a card, 40,000.

Japanese Official Report, forwarded by U. S. Minister Griscom:

Wages and hours of labor in raising cocoons.—The wages for women and children vary according to districts, but average wages for women employed as operatives in cocoon raising throughout Japan are 20 sen (10 cents) per day; children get about 5 cents. During the rearing season of the silkworms no holidays are given. Daily working hours also vary, but generally speaking women work from ten to twelve hours; children from six to eight hours. The average number of days the raisers employ helpers in a year is the same as the number of days occupied in raising cocoons.

Wages and hours in silk reeling.—The average daily wages of the first-class female operatives is 50 sen (25 cents), and of the ordinary class of female operatives 15 sen (7 1/2 cents). Superintendents earn from 30 to 100 yen ($15 to $50) per month, and overseers from 15 to 30 yen ($7.50 to $15) per month. The usual price paid per pound for reeling is 60 sen (30 cents). Male operatives and children are not employed in the same works as female operatives in silk-reeling establishments, but they are employed in other works. The monthly pay for male operatives and children is as follows: Male operatives and dressers, 15 to 20 yen ($7.50 to $10); children, 3 to 4 yen ($1.50 to $2).

The hours of labor are not fixed by law or custom, and vary according to the seasons. Operatives generally work from twelve to fifteen hours per day. The number of days on which the workers are employed varies according to districts, but is about two hundred and fifty days per annum. Hours of labor in other occupations taken up by silk-reeling operatives vary greatly, and the wages for such can not be ascertained.

The inhabitants of Phoenicia and Tyre were the first acquainted with the process of dyeing, the Tyrian purple being of so gorgeous a hue as to baffle description.

To the Arabians we are indebted for many useful inventions, among them being the art of making paper from rags and that indispensable article of wearing apparel, the shirt.

Injuries to Workmen.

To Germany belongs the high honor of being the first to provide compensation for injuries to workmen without proof of negligence. Her example has been followed by nearly all the other European countries, including Great Britain and the British colonies, but the principle has not yet been adopted in this country, although it has been discussed and bills to carry it into effect have been introduced in various States. Compulsory compensation is based on the assumption that a workman never exposes himself to the dangers of his occupation for the purpose of injuring himself; and it relieves the workman from seeking redress by the devious and precarious methods of the law.

The laws on the subject in various countries have recently been investigated by a British Parliamentary Committee, from whose report we make the following extract showing the total amount of compensation in various countries:

The German system, which appears to have become crystallized in a form of insurance, now covers by far the majority of wage earners. Her inauguration of a scheme of industrial protection has been followed more or less by almost all other European countries, including the United Kingdom. Austria was the first to adopt the example. In that country the amount expended for compensation in 1902 reached $1,483,897, still this was a long way behind the outlay in Germany, which was no less than $26,108,649 in the same year.

Norway followed Austria in order of time, then Finland and the United Kingdom, but only in the cases of Germany and Austria has sufficient time elapsed to afford accurate statistics as to the cost. A communication from the Ocean Insurance Company, however, is to the effect that the liabilities created on the Continent are much greater than in England. The United States has not yet adopted the principle of workmen's compensation for accident without proof of default, and therefore offers no means of comparison. The British Colonies have followed very closely the example of the mother country.

So far from the factory system being a modern invention, it was in full operation and conducted under patriarchal influence, some three thousand years ago.

THE MANCHESTER ROYAL EXCHANGE.

BY JOSEPH HARGREAVES.

The first known record of an Exchange at Manchester dates back to 1729. Fig. 1 is a sketch of the first building, which was erected in 1729 and taken down in 1790. The next Exchange was opened for business in 1809,

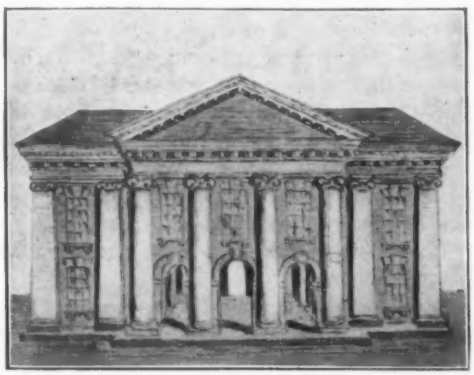


FIG. 1.

the merchants in the meantime meeting in devious ways, necessity being often the mother of invention of ways and means whereby they could meet and transact their business. In 1848 the building was enlarged and in 1871 was taken down. In 1851 Queen Victoria visited the Manchester Exchange and afterward honored it with the title of "Royal." Since then it has been known as the Manchester Royal Exchange.

The present building was erected in two portions, the first being opened in October, 1871, the other in October, 1874. A cut of the building is shown at Fig. 2. The area of the large room of the Exchange, Fig. 3, is 4,405 square yards. The length from Cross Street to Exchange Street is 206 feet and the width from Market Street to Bank Street is 192 feet. The clear width of the area under the central dome is 96 feet. The height from the floor to the cross beams is 60 feet, and from the floor to the summit of the dome is 125 feet.

The volume of business which is transacted within this, the largest commercial exchange in the world, is not ascertainable, but is of huge dimensions. Cloth is sold, yarn bought, and all business transactions connected with the cotton industry are negotiated and settled here by word of mouth only. Of the many verbal contracts involving vast totals practically none are afterward repudiated, a striking proof of the honor among British merchants. These contracts are confirmed in writing as soon as the parties reach their places of business; if not the same day, then on the following day.

FIG. 2.

The present Royal Exchange has a membership of about 8,200, each paying a subscription of three guineas or $15.12 per year. In connection with the Exchange is a very

good reading room supplied with all the daily and commercial papers. All around the great meeting hall are fixed stands upon which are placed the daily bulletins of the different markets, and the particular telegrams and news which are considered of interest to the members. Any business man will easily imagine the keen, anxious looks cast upon these bulletins, especially in times of rapid fluctuations. Indeed, at any time it is a study to watch the members, each with his own particular interest at heart, scanning the bulletins displayed in the room.

It is almost impossible to convey an idea of the scene which greets the stranger upon his visit to the Exchange. At one end of the great hall there is a telephone gallery. From the centre of this gallery strangers have a full view of the great hall filled with a confused mass of humanity surging to and fro, hurrying and hustling, earnestly intent upon bringing grist to the mill and daily bread to thousands of operatives who are employed in making the goods here bought and sold. Some members are standing like statues with book in hand awaiting the next person who may wish to engage their attention; others are

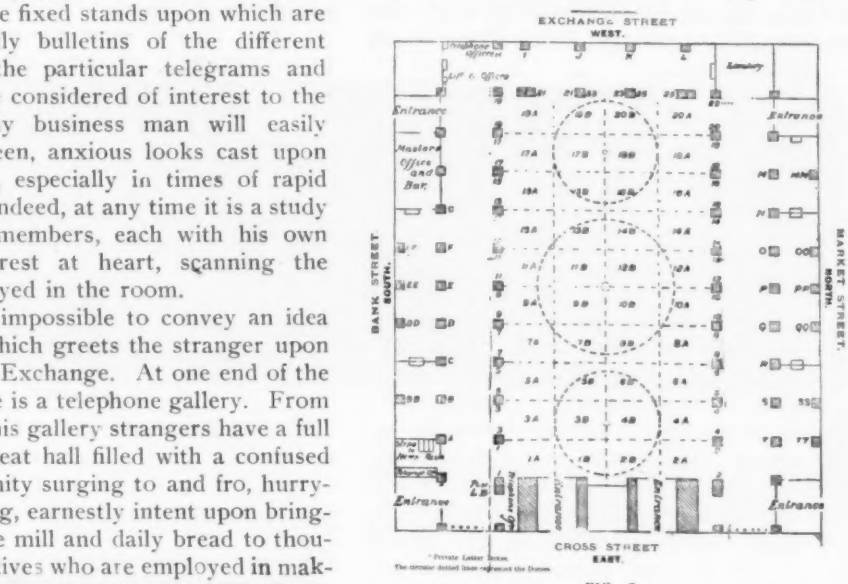


FIG. 3.

person he wants to see. The method is quite simple. Referring to Fig. 3, which is a plan which becomes their established place of bus-

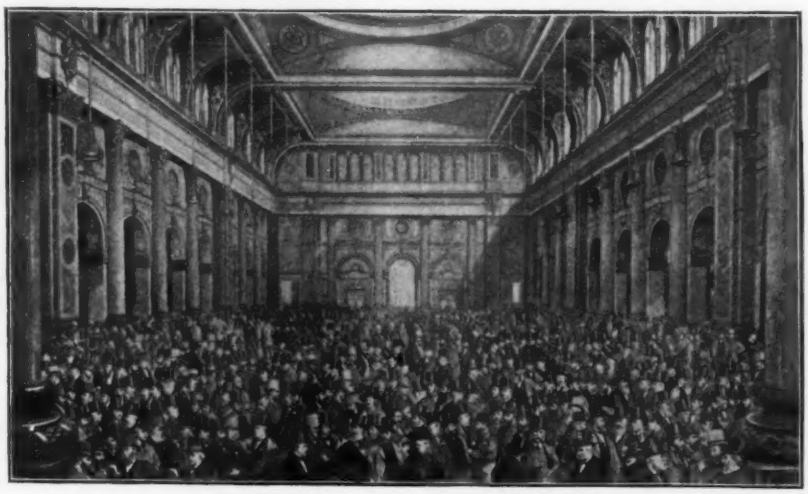


FIG. 4.

chatting away or earnestly debating the pros and cons of the problem they are solving; still others are dodging about through the crowd in which there does not seem to be room to turn round. One can only wonder how on earth a man can find the particular

of the hall in which the members meet, the numbers and letters denote the various positions of the members. An indefinite number of members can use the same position,

iness where anyone can find them during business hours. The position of each is indicated on memorandums, business cards and advertisements and can also be found in the Exchange directory.

In a general way the representatives of each section of the cotton industry congregate in separate groups. Like birds of a feather, they flock together, manufacturers in one place, cotton spinners in another, machinists and machine brokers in another. Then the general retinue dealing in all the accessories to the cotton industry are flying around to see if their clients are needing anything from a slashing machine to a strap lace. Merchants and cloth agents are going to and fro to their respective manufacturers for quotations and if satisfactory to fix up their orders. Spinners in their turn visit the manufacturers to quote prices for yarn and book any business which they can arrange with their clients. It must be understood that to a very great extent manufacturing and spinning are carried on separately in England. A merchant or agent during the hours of change, say from 2 to 3 P. M., will give the manufacturers a good many inquiries for cloth quotations. These are examined and frequently orders are placed before leaving the Exchange. The manufacturer often covers his cloth transaction by a purchase of the required yarns before leaving the room. Thus in a very short time transactions of great amount are concluded.

Such an institution is a necessity to the immense British cotton industry and its kindred trades.

Distinguished persons visiting Manchester often pay a visit to the Royal Exchange when a scene of great enthusiasm is enacted as the visitor takes his place upon the special balcony high up in the Hall overlooking the spacious room. The scene during the visits of Lord Roberts in 1898 and of Dr. Nansen, the explorer, in 1897, and many others will be long remembered by those who were present.

These visits are but infrequent interruptions to the business of the Exchange. Day in and day out the members continue their almost frantic struggle for wealth, while high above the din, inscribed in gold letters around the dome are the words: "A good name is rather to be chosen than great riches, and loving favor rather than silver or gold."

THE TEXTILE FIBRES OF PARAGUAY.

BY E. L. RUFFIN.

(Continued from April.)

PINEAPPLE.

The pineapple plant is usually cultivated between the rows of bananas. Its fibre is fine and would no doubt be of considerable commercial value if it could be economically cleaned and put on the market.

YACARATYA.

The yacaratya tree grows to a height of 21 to 36 feet. It bears a pear-shaped fruit which the natives use for food. It is found principally in the woods and its trunk is so soft that

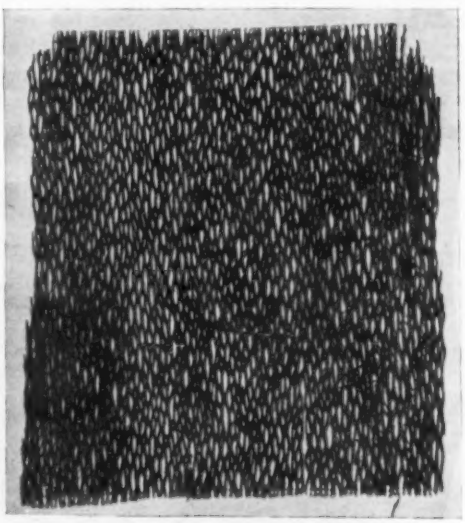


FIG. 12.

it can be cut through with one or two blows of a machete. When felled it is attacked by numerous insects which eat out the pulpy part and leave it full of multitudinous pores. Originally it is not a textile tree, but after this attack of the insects it is left serviceable as a textile, in the sense that it may be used for filtering purposes and in the manufacture of straw hats. On account of its porous nature

it is used for the inside bands. The wood containing the larger holes, Fig. 12, may be used by crossing the pieces in layers for filtering.

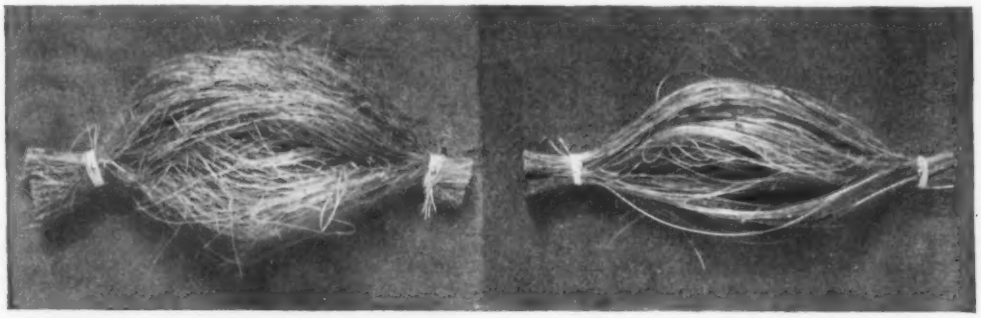


FIG. 14.

FIG. 11.

SAMUHU.

This is a large tree, about the size of the chestnut, and produces a fibre called samuhu or vegetable silk. In Fig. 13 the bolls alone are visible, the leaves appearing later. These bolls are about the size of a man's fist and open during October and November. They contain a silky fibre, a sample of which is shown at Fig. 13, which the natives use for stuffing cushions, bed covers, etc. The tree is distinguished from every other by the exceeding greenness of its trunk. The bark contains a fibre that is also serviceable.

SANSAVERDE.

Sansaverde, Fig. 11, is a fibrous plant of Paraguay that is very similar to caraguata, in fact it is almost indistinguishable from it in its natural state. The fibre is coarser than that of caraguata, and its uses are very much the same.

BANANA.

The banana plants of this country supply a very strong and serviceable fibre which is found principally in the stem. This would no doubt afford a considerable supply of raw material for a fibre-cleaning machine, as bananas are largely cultivated here. The climatic conditions favor its growth and the native planter takes to its cultivation very willingly. There is no special difference between the banana of Paraguay and those of other countries.

PIRI-MI.

This is a grass that grows principally in the swampy fields to a height of two or three feet. It grows wild and has a long stem with a small bunch of flowers at the top. A sample is shown at Fig. 14. It abounds to a considerable extent, and on a plantation would yield in a short time. It has no special use here, except that of tying up bundles coming from the country into the town.

FIG. 13.

GUEMBEPI.

Guembepi abounds in all parts of the country and is very much used as a decorative plant in gardens adjoining private houses because of its large green leaves. Out in the woods a great many of these plants are found growing in the tops of trees, for the reason that when the tree was young the guembepi plant attached itself to the growing tree and went up with it, it being capable of sustaining itself in the air as an aerial plant. It makes no difference how high the tree grows, the plant roots extend to the ground. In the illustration, Fig. 15, there is a plant near one of the large trees. The plant is indicated by a cross (x); one of the roots is indicated likewise, and is seen clinging to the tree. The skin of these roots is peeled off in long strips, depending upon the height of the plant, and produces a fibre that is practically indestructible. Out of this skin are made many beautiful articles, it having a very glossy black color; some of it, however, is a clear yellow. This skin can be twisted into rope without being put through any preparatory process. In raising some boats recently that were sunk many years ago, it was found that the ropes which were made from this fibre were intact.

CURUNDAY OR URUNDIY.

This is a straight tree something like the hickory of the United States, but grows very rapidly and is found everywhere in this country. In one year it reaches a growth of from 12 to 15 feet. Its fibre is the thin bark of the tree, which is peeled off nearly the entire length and put into water, by which process the fibre is more easily extracted. This fibre resembles hemp or jute and is used for ropes, which have the property of not rotting in water. Two young trees are shown in Fig. 16, in front of the office of the chief of police in the little country town of Guarambere. Under the trees is a jolly crowd, including the town officials, who are much pleased to know that some one in far-off North America is taking an interest in the textile plants of their country. Perhaps the cause of the jubilee is in the glasses on the small table.

GUAYAYVI.

The wood of this tree is very hard and tough and is valuable for making handles of tools, axes, etc. The natives use it for yokes for oxen, cart axles, etc. The centre portion is streaked with yellow and used in the manufacture of guitars.

CURURU-YVI.

Cururu-Yvi is a small tree from two to fifteen feet high, growing abundantly in damp places. The bark can be used immediately after being stripped from the tree. The natives use it for rope and it is one of the most hardy fibres they have.

FIG. 15.

YVAPOHY.

This is a large tree that seems to wrap itself around other trees. It is scattered throughout the different woods of the country and its bark is fibrous. This bark can be taken from the tree and immediately used for rope.

YSIPO.

This is a grape-like vine hanging from the tops and branches of trees and is found everywhere throughout the woody section. From this I believe a fibre can be extracted, but its principal service in this country is for tying

fences, bales of hay, and any other things needing strong rope, for which its length, straightness and flexibility make it an excellent substitute.

PYNO-GUASU.

This is a small tree scattered throughout the hilly country. It is easy to cultivate and grows about six feet in one year. If cut down it will sprout again. The bark is put into

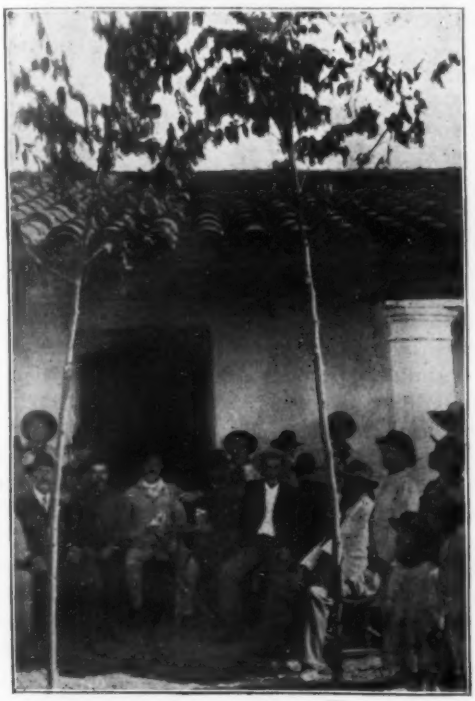


FIG. 16.

water and cleaned; the fibre resembles hemp. The Indians make a fine textile of this which they employ in making hammocks.

CARANDAI.

Carandai is a palm tree that abounds very largely in the southeastern part of the republic and especially in that part called the Misiomes. It is not so abundant as the mbocaya recently referred to, but the leaves produce a very good fibre and twice a year they can be cut without injuring the tree if a few leaves are left in the centre. If all are cut the plant will not sprout again.

TYPYCHA-HU.

This is the principal name for a certain malva or weed-like plant from three to six feet high containing considerable fibre in the skin or outside coating. There are three different varieties, known in the Guarini language as typycha-hu, typycha-morosi and typycha-caagwy. By these names they are easily identified among the country people. The first named grows as high as a small tree. By crushing this weed the skin easily falls off, leaving a stem-like centre; it is easily peeled and the fibre is extracted by rubbing it together in the hands.

LOOFAH.

This plant grows very plentifully here and the fruit measures from seven to 20 inches and upward. It could be sent to the United States in reasonably large quantities. The people in this country use it principally for domestic purposes and for making novelties. When the fruit is nearly mature it is taken to a stream where it is beaten and washed to remove the gummy substance, the part remaining being very white, clean and sponge like. If there is any machine that could do this work economically and that could be imported at a reasonable price, the planters would be glad to know about it.

COTTON.

There are three kinds of cotton in Paraguay. First there is a native cotton called mandy-yu which grows on a high bush and yields for seven to ten years. The bolls are about one-third the size of those in the United States and contain about one-third the amount of cotton also. The second variety is of a reddish brown color. Mixed with white cotton it would make a beautiful garment whose colors would be fast. I send a small sample of this variety in its raw state and a piece made into thread, also some of the first mentioned. The third class is that introduced from the United States and which thrives very well. I will quote a few words from Dr. Manuel Dominguez, Vice-President of the republic, who recently published a pamphlet on cotton and its production in Paraguay. He says:

At the end of the fifteenth century cotton was produced in Paraguay and Don Carlos A. Lopez, acting more and speaking less, ordered that cotton be cultivated, and history assures us that in 1853 there were 58,000,000 plants of cotton in Paraguay.

Don Carlos Lopez was one of the presidents of the republic and one of the most progressive rulers the country ever had. Dr. Dominguez further states that Paraguay can produce more cotton than any other country in the world, rating it at more than 900 pounds per acre, and that in the Paraguayan chaco after six years of cultivation it will yield 1,000 pounds per acre. He closes by urging loans to be made for the cultivation of cotton on condition that these loans be paid back in cotton and that throughout the different parts of Paraguay the best instruction should be given relative to the modern system of cultivation, predicting an exportation of the raw material to the amount of one hundred million dollars.

CORRECTION.

In our review of Seasonable Fabrics in the May issue the broadcloth fabric of the Arnold Print Works was incorrectly quoted at 17 1/2 cents. We are authorized by the manufacturers to state that these goods are sold at 19 cents, and that any lower quotation is erroneous. This broadcloth fabric has been very successful and the price is firmly maintained.

UNEXAMPLED PROSPERITY.

Business in English cotton mills was never so good as at present. The demand for goods comes from every quarter, at home and abroad. The present condition is in strong contrast with that of last year when mills were running short time and business was brought to a standstill by the scarcity of cotton. The activity now is a result of last year's depression. Stocks of goods were reduced by the short time and the present demand is for immediate consumption as well as for bringing the stocks to the normal volume. The English machine builders are sharing in the present activity and cannot supply looms and other machinery fast enough to satisfy the mill owners.

ENGLISH TWEEDS FROM ENGLISH WOOL.

(From our Special Correspondent.)

One of the commonest cries in Great Britain today is "support home industries." The appeal confronts one on matchboxes, on billboards, in the newspapers, and it recurs with frequency in business arguments. In the textile trade one finds the phrase tagged to piece goods in the shop windows. Manufacturers of Belfast linens, Donegal, Connemara, and Harris tweeds from the far north of Scotland, all entreat the consumer to consider their claims as fellow countrymen. Now there is a newcomer. The Scotch tweed of Scotch wool and the Irish tweed of Irish wool find a competitor in English tweed of English wool and the world and his wife are enjoined to buy no other than this last.

This nationalization of wool and its manufacture is an incident of more than insular importance, because the presumption is strong that the policy pays. It must rest with the American to determine whether some sort of localization would be good for him individually. One may suggest that such a measure might serve as an excellent basis for advertising.

Farmers are so numerous that it does seem conceivable that a manufacturer posing as the farmer's friend might attract farmer's custom to the goods he sells. One firm in England aims to capture the sympathy of those concerned with land. Farmers, sportsmen and landed proprietors are urged to buy Hydea tweeds manufactured by Apperly, Curtis & Co., Ltd., of Stroud in the west of England. The salient characteristics of West of England makes are known to importers everywhere. Was it not West of England cloth that was tested in the mediaeval days by its ability to stand erect upon its edges? Some such criterion of merit is applied to Irish friezes by Irish farmers of the present day. It was the Flamands or Flemings from the low countries who introduced the craft to Western as to Eastern England. They were attracted to Stroud not only by the striking loveliness of the Golden Valley, but

by the peculiar quality of Stroud water. The river Frome gave the water best suited for the ancient blue and scarlet dyes and by its banks the Dutchmen "exercised the feat or mystery of making, weaving or rowing of cloaths." Here they grew rich and here

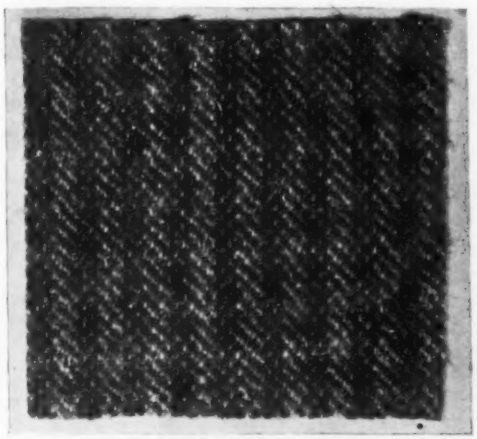


FIG. 1.

were bled by successive monarchs for the conduct of European wars.

The successors of these exiles have in some cases languished and grown supine. The trade of the West has lost relation with

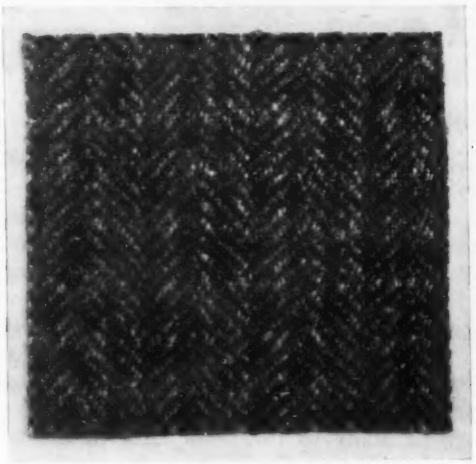


FIG. 2.

that of Yorkshire and the Scottish borders. Yet it continues and from that Sleepy Hollow has sprung the new endeavor above detailed. Mr. Alfred Apperley, managing director of the firm, is one of those rare manufacturers who are pastoralists as well. He is a farmer of flocks of Hampshire Down sheep and the produce of his own rich herbage eked out by that of leading growers in the same district goes to make the Hydea tweeds. No shoddy, no foreign, no Colonial wool enters into their constitution. Indeed the cloths contain but a small portion of the natural waste of the materials from whence they are made. The fibre is equivalent to a fine cross-bred, finely serrated, spongy and with many burrs. The tweeds themselves are crisp to the touch, porous and cellular in a phenomenal degree. They are cloths preeminently for wear and though in a hurricane the fabric will admit draughts through its

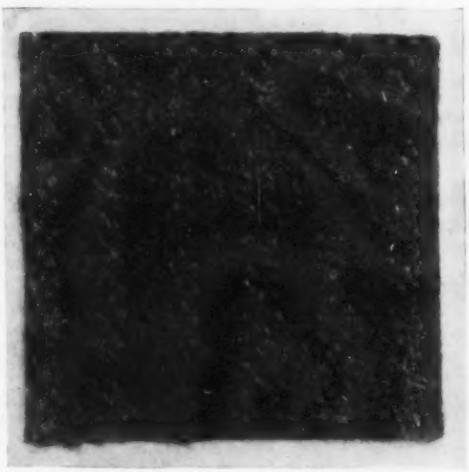


FIG 3.

innumerable interstices, in normal climates it affords complete protection, chiefly because the fabric envelops air while yet permitting ventilation.

The fleeces after liberal skirting are sorted into three qualities at most and the wool is washed in fork machines. This process does little to get rid of vegetable matter so that next the stock is carbonized with weak sulphuric acid. Two washings are required to be rid of the vinegary smell which tells of lingering traces of acidity. Care and watchfulness are given so that the vitriol shall do no harm to the wool. Drumming suffices to remove the carbonized foreign matter and

the stock is ready for the dye-house or the cards.

All spinning is done on mules and thereafter the process is that common to good tweeds. The looms are of the heavy type. In finishing, the goods are washed clear of soap and are hot pressed. Raising and cutting are variable. The result is the crisp, strong, springy tweed that one expects from such wool and such routine. The ranges of samples betray a certain family likeness as do all patterns coming from one mill and designed by one set of brains. Yet there is a diversity of style and color and it is more than ordinarily desirable that there should be. When a manufacturer essays to narrow down his customers to one series of ranges he must manifestly set his sails to catch most winds.

Selected designs are here shown of Hydea tweed, Figs. 1, 2, and 3. As may be seen they are of a class likely to appeal to the refined tastes. Eschewing the eccentric, the designer aims to produce cloths fit for city and for country wear and he retains touch with the prevailing fashion. In the matter of price the Hydea material is no more expensive than goods of the same class produced from imported wools. Varying with the weight prices are made between $1.12 and $1.68.

The Hydea line of goods is still in its early days, but the suceess gained is an encouragement to go on. The mill is not dependent wholly on these articles by any means, though under the impetus of advertisement the proprietary make forms an increasing factor in the business. As a second string to the Hydea bow, traveling-rugs are made. Thick, blankety, well-raised rugs with fringes and in large tartan checks are put on the market at the retail price of $6. This is three times as much as one need pay for shoddy-filled rugs and wraps. The difference between the two is strongly marked, however, and the trade in the higher class of goods falls into other hands than those dealing with the cheapest rugs.

FIG. 4.

It is a fact also, which perhaps holds good in all countries, that dealers in articles made up and complete, as rugs are, can be reached more easily than the tailor. Nothing comes more naturally to the tailor than to assure his customer that the cloths in his stock are infinitely superior to any not in his stock. To force the tailor to procure the especial tweed one requires is not easy for the customer and on the manufacturer devolves the

task of seeing that each creditable tailor keeps his proprietary fabric in stock. That also is not easy if experience gained in England may be trusted, but it is a difficulty that all vendors of proprietary wares, each in his own degree, has to overcome. The readiest fashion, in the opinion of those responsible for the Hydea goods, is to advertise in the full sight of the buying public. For this purpose not only are catch phrases and verbal persuasions being utilized, but illustrations are also being made to serve their turn. Pictures of the identical sheep from whence come the tweeds, are distributed, one being shown at Fig. 4. They portray Hampshire Down sheep on Hyde Farm in the famous Cotswold Hills. A special title to interest is that the flock should be the property and pride of one of the greater manufacturers of the English West.

LINEN MUMMY CLOTHS OF THE EGYPTIANS.

Editor Textile World Record:

The accompanying illustrations show samples of mummy cloths which the writer recently received from the Gizeh Museum of Egypt. They are typical linens from three periods, namely:—

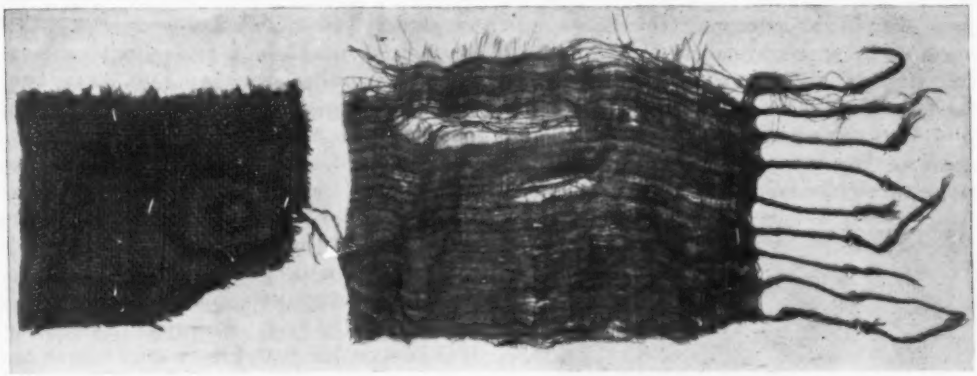


FIG. 1.

FIG. 2.

Figs. 1 and 2. From the 21st and 22d Pharaohic dynasties, 800 to 1100 B. C. 2700 to 3000 years old.

Figs. 3 and 4. From the 12th dynasty. 2000 B. C. 3900 years old.

Fig. 5. From the Coptic dynasty. More recent than the others. The Copts were the Christian descendants of the ancient Egyptians.

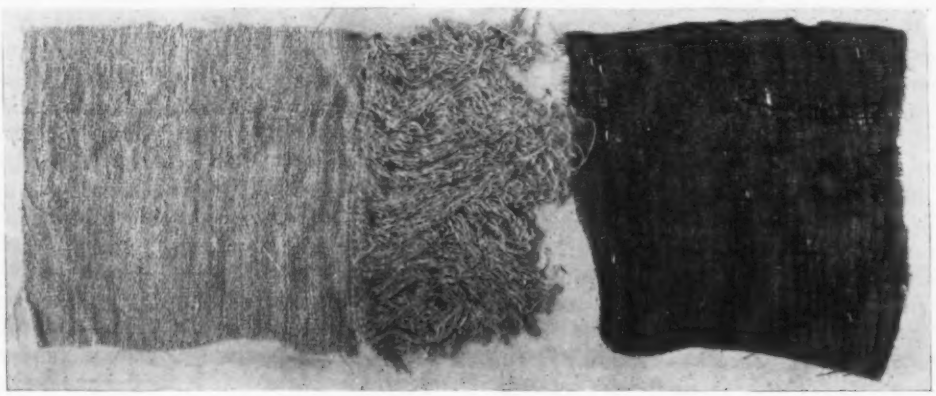


FIG. 3.

FIG. 4.

It should be stated at the outset that in all the processes connected with the manufac-

ture of fine linen, the ancient Egyptians showed a wonderful degree of skill, and their productions have not been surpassed in modern times. There were very many qualities manufactured, for a great range of uses, and the fabrics had a worldwide celebrity. Immense quantities of flax were grown in Egypt,—far beyond the needs of the population—and Pliny accounts for the excess of production in the large exports to other countries, notably India and Arabia,—for the quality of the product of Egyptian looms was considered superior to all other. The home consumption, however, was considerable, be-

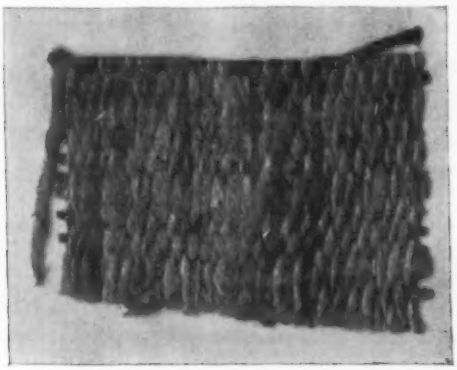


FIG. 5.

cause the more luxurious the habits of the people, the more were linens valued and used, and it must be remembered that linen was the aristocratic textile fabric of the country, fabrics of cotton, or mixed fabrics of flax and cotton, being employed for hangings, upholstery, etc., and not for clothing.

The centre of the industry was undoubtedly the city of Thebes, as it was the most important place of production, and linen manufacture was its chief industry, giving employment to a large number of the inhabitants. There were doubtless many distinct establishments, as the factory system (as we understand it today) was unknown. The weaving was done upon single hand looms, operated by women, who also spun the yarns. Many of these looms doubtless were scattered over the country just as the weaving of linen in the United States, less than a hundred years ago, was a household industry.

What little practical knowledge we possess of the linens of ancient Egypt has been derived from the mummy cloths, for all else perished thousands of years ago. These fabrics varied in texture from examples as coarse as burlap, or even coarser, such as Fig. 5, to linens of wonderful fineness and delicacy, though coarse grades were most commonly used. Probably fabrics of the coarseness of Figs. 1 and 5 predominated, the finer grades, such as Figs. 2, 3 and 4 being employed by the higher classes, and only then for outer wrappings. As many as seven grades of cloth were frequently used, the coarsest being next the body, and usually found impregnated with the resins and bitumen employed in the embalming. Wherever linens of exceeding fine texture have been discovered, they have invariably been found to enwrap the body of a priest or noble, and it is supposable that Fig. 2 might have been taken from a mummy of the higher class. The cloths found in the tombs of kings, especially of the earlier dynasties, were necessarily of the finest and most costly.

The demand for linen fabrics with which to enwrap the dead must have been very large, for 300 yards of web have been taken from one body. The width of these bandages varied from a few inches to two and even three feet. The cloths have been found in a great variety of colors, white predominating, though yellow, saffron, red, purple and blue were common, with many intermediate shades. It cannot be proved that the ancient Egyptians had a knowledge of chemistry or of mordants, though they must have had a very practical knowledge of the use of the metallic oxides and were able to produce dyes that can scarcely be matched today.

While the Egyptians used embroidery on their garments, a reference cannot be given to embroidered mummy cloths, although fringes of varying depths are common, some of them being knotted like the shawl fringes of today. Figs. 2 and 3 show examples of fringes, the fabric of Fig. 2, which is the finer weave, being finished with a dainty border in blue on a saffron ground. The dyes in these colored borders were evidently applied to the yarns before weaving. Such borders are common in the linens of the 12th dynasty,—which goes back about 4,000 years,—though

the dainty example reproduced by Fig. 2 is more recent by a thousand years, dating about the 21st Pharaohic dynasty.

In the weaving of these linens it was common to use twice the number of threads in the warp than in the weft, the thread of the warp being double; that is to say, if the warp was composed of 90 threads, the weft would show 44 threads, though 140 threads to the inch of warp is not uncommon. But the most remarkable reference is to a piece of Memphis linen with 540 threads to the inch, or, 270 double threads in the warp, and 110 in the weft. It has been claimed that some of the earlier linens are so fine that the finest cambric lawns of today would seem coarse by comparison. To the modern spinner it must be almost beyond belief that so wonderfully fine a thread could be spun, or that reeds could be found slight enough to construct the looms with which these threads were woven into fabrics.

So far we have been discussing the fabrics taken from the mummies. Of the beautiful and costly robes worn in life we know nothing beyond what Pliny and other writers of his time may have recorded, and their histories go back only a few hundred years before the time of Christ. But it may be conjectured that they were rich beyond our conception of the possibilities of linen, the pride of the most skilful of the workers of Thebes.

The quality of the ancient flax may have had something to do with the fineness of the linens. Another species of flax than the Linum usitatissimum of our time may have been employed by the earliest of the ancient Egyptian flax workers, for we know that a different species, thought to be Linum augustifolium, was used by the Swiss Lake dwellers in the stone age of Europe.

De Candolle says: "Thus the first Egyptian white race may have imported the cultivation of flax, or their immediate successors may have received it from Asia before the epoch of the Phoenician colonies in Greece, and before direct communication was established between Greece and Egypt under the fourteenth dynasty. A very early introduction of the plant into Egypt from Asia does not prevent us from admitting that it was at different times taken from the East to the West at a later epoch than that of the first Egyptian dynasties. Thus the western Aryans and Phoenicians may have introduced into Europe a flax more advantageous than Linum augustifolium during the period from 2,500 to 1,200 years before our era."

It is presumable that the common flax of today, that is, Linum usitatissimum, was the flax employed by the ancient Egyptians even back to the earliest times, but we do not know it positively. It is more likely that the fineness of their yarns was the result of a wonderful skill in the cultivation and preparation of the flax fibre, of which we have no knowledge, the special methods pursued being lost arts, with many other lost arts of ancient times.

CHARLES RICHARDS DODGE.

Washington, D. C., April 6, 1905.

Although the Egyptian cloths cannot be classed among our seasonable fabrics, they possess a peculiar interest even to the practical textile manufacturer of today, and we have, therefore, analyzed the five samples received from Mr. Dodge with the following results:

	Threads per inch Warp	Filling	Average count 300 yds. per lb.	Sq. yds. per lb.	Loss by Boiling-off
Fig. 1	32	56	44	4 3/8	16 per cent.
Fig. 2	72	96	291	14 1/10	10 "
Fig. 3	44	152	99	8 5/8	10 "
Fig. 4	56	120	484	22 1/10	15 "
Fig. 5	8	24	5	1 1/3	18 "

The sizes of the yarn in the above table are given by the English linen system (300 yards per pound), which is the standard for the world. These sizes and the yards per pound are indicated for the cloth after the foreign material has been removed by boiling-off. The yarn has been greatly weakened by time and it is probable that the material has shrunk more or less in weight since the linen was spun thousands of years ago.

In ancient Egypt flax was spun with the distaff and spindle which are described in Smith's "Dictionary of Greek and Roman Antiquities" as follows: "The spindle was a stick 10 or 12 inches long, having at the top a slit or catch in which the thread was fixed, so that the weight of the spindle might continually carry down the thread as it was formed. Its lower extremity was inserted

into a small whorl made of wood, stone or metal, the use of which was to keep the spindle more steady and to promote its rotation; for the spinner, who was commonly a female, every now and then twirled the spindle with the right hand, so as to twist the thread still more completely, and whenever by its continual prolongation, it let down the spindle to the ground she took it out of the slit, wound it upon the spindle, and having replaced it in the slit drew out and twisted another length."

FIG. 6.

FIG. 7. FIG. 8.

Fig. 6 shows an Egyptian spinner as represented on tablets found in tombs unearthed in Egypt. Fig. 7 is an Egyptian distaff, now in the British Museum; Fig. 8, a spindle. The methods of weaving were equally rude. Fig. 9 shows two weavers, one on each side of the loom, the filling being drawn through the shed by a long metal hook instead of a shuttle.

These primitive processes of spinning and

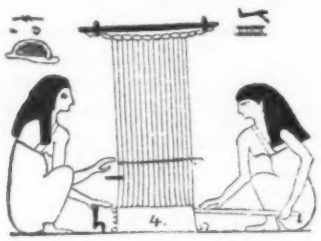


FIG. 9.

weaving remained unimproved until the advent of the spinning wheel which was introduced into Europe in the fifteenth century. The invention of the power spinning frame and loom were the next important developments in textile manufacturing. These new machines increased the product of the textile worker many fold, and also enabled more uniform goods to be made, but the workmanship of the old Egyptian mummy cloths is equal to that of many grades of goods manufactured today. In view of the rude processes used in its manufacture the cloth shown at Fig. 4 ranks with the pyramids as evidence of the patience and skill of these ancient Egyptians. In pointing it out to our readers we can use the words of Napoleon to his soldiers at the battle of the Pyramids: "Forty centuries look down upon you."

WOOL COMBERS IN ENGLAND.

Editor Textile World Record:

The article in the last number of your journal on the state of the workers in English wool combing factories contained such inaccurate statements as to justify the real facts being published. The charges originally appeared in Pearson's Magazine some years ago and were printed to show the horrible state of the workers in various industries in England. Their accuracy can be judged by the illustration which accompanied the article on wool combing in Bradford and depicted a young woman attending a Noble comb dressed only in a skirt and without any clothing from the waist up, for which, after a storm of protest, the printers made an apology.

The working time for day hands never exceeds 56 1/2 hours per week and the night men work not more than 5 nights of 12 hours each. It is only in extreme cases and when business is exceptionally good that they work an extra half night, from Sunday midnight to six o'clock the following morning, for which they receive over-time pay. There is, at least, one interval of 30 minutes allowed by every firm for supper, though in many places two stops are made of 20 minutes each during the night for this purpose, and though the men frequently eat while at their machines it is done because they prefer to use the mealtime to go out of the factory to enjoy a smoke.

The wages do not exceed the amount stated in your previous article, viz.: $5.75 per week. Generally it is a little less, but the weight of top obtained per comb only averages about half what would be expected in America, the combs rarely running at more than 3 1/2 to 4 turns per minute.

Any English superintendent will admit that the class of men working in a combing mill at night are not a healthy lot, for the reason that the strong, healthy man prefers and obtains outdoor work, while many old men and those physically unfit for heavy labor turn gladly to wool combing to earn a living. The factories are regularly examined by the inspector of factories, who takes care that the men work under proper conditions.

When allowance is made for the difference in purchasing power between English money and American, it will readily be seen that there are much worse positions than being a comber on the "night-shift."

FAIR PLAY.

SHUTTLE GUARDS.

BY ROBERT DANTZER, Professeur a la Societe Industrielle, Amiens, France.

In accordance with the terms of a circular issued by the French Government, Nov. 18, 1901, all power looms running at a speed of more than 100 picks per minute must be equipped with snuttle screens or guards, the choice being left to the manufacturer, who makes the selection on his own responsibility. The use of these attachments has for its object to prevent accidents by the flying of the shuttles from the looms. The trouble may be due to any one of several causes.

First may be mentioned an excessively high speed or a variation in the speed of the loom. This cause is very apt to arise in mills where the machinery is driven by water power or by motors that are not well regulated. Sometimes the trouble is due to the bad condition of the various parts of the loom, such as wear of the picker and shuttles; the improper adjustment of the picker and shuttle box; a loose or improperly adjusted reed; improper adjustment of the harness, etc. Flying out of the shuttles may be caused by timing the picker stick too early or too late; too strong a stroke; having the temple too high; the shed irregular, etc. Frequently the shuttle is thrown out of its course by broken threads or by broken heddles that interfere with the movement of the adjacent threads and cause an irregularity of the shed.

Shuttle screens consist of netting placed in such a position as to catch the shuttle when it passes the box. It generally consists of a frame of wood or iron over which wire or twine netting is stretched. The latter is preferable as it is not as likely to damage the shuttle which may strike it. Some screens made of willow are still used. Each loom requires two screens placed opposite each other at the end of the boxes. The width should be equal to at least the distance for

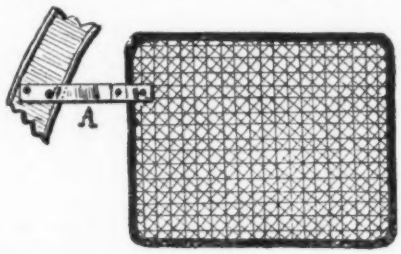


FIG. 1.

which the lay vibrates, the height being from 24 to 36 inches. The screen can be fixed to the frame of the loom as shown at Fig. 1, in which case it should be hinged at A, in order not to interfere with the movements of the weaver. Figs. 2 and 3 show two other methods of suspending the screen. These have the advantage of arresting more easily

FIG. 2.

the shuttle in its flight and enabling the screen to be swung out of the way whenever desired. In the form shown at Fig. 3 the screen is connected with a spring which holds it under pressure and this makes it unnecessary to have a frame, a piece of wire screening serving the purpose.

This method of guarding against flying shuttles is more satisfactory than any other yet devised, as it protects the weaver from the shuttles of neighboring looms. The shuttle guards are attached to the loom lay in order to prevent the shuttle from flying out. There are many different devices, but

FIG. 3.

we will mention only the principal ones in use. In spite of the great variety it will be well to state that very few of the shuttle guards absolutely prevent the shuttle from flying out, but the greater part of them are fairly efficient in preventing the shuttle from flying upward. They may be divided into three classes: fixed, movable, and automatic. The simplest of the fixed guards consists of a rod attached to the loom lay and having the ends bent in the desired form, the rod adjusted opposite the metal of the reed and parallel with it.

Figs. 4 and 5 show such arrangements. Fig. 4 is a sectional view, Fig. 5 is a front view, showing the lay, reed, shuttle and guard. This arrangement is known as the Sullivan system. When the loom is very wide and the rod of which the guard is made is small, the latter is sometimes supported in the center as shown at Fig. 6, which illustrates the shuttle guard invented by Gaspar Honneger, and used on the Northrop loom. Fig. 7 shows another style known as the Ivers guard. Here instead of a wire rod, a cord, C, is stretched between the brackets, B B, the latter being fixed to the lay.

Shuttle guards are open to various objections. They make a change of the shuttles more difficult and what is gained in security is counterbalanced largely by the loss in time. The guards are also more or less in the way when tying-in threads, and as they make a shadow it is more difficult to discover defects in the goods. It may be added that while shuttle guards may prevent deflection of the shuttles while passing from one selvage to the other they cannot prevent such deflection when the shuttle is leaving the box. It is necessary to leave a certain space at this point in order to change the shuttles in the boxes. The shuttle is likely to be damaged by striking the guard, the wood being roughened, and this rough place in turn breaking the warp threads. There is also a liability of the filling being broken by contact with the shuttle guard. With the Gaspar Honneger guard the shuttle is prevented from flying out of its course as it leaves the box by the cap or casting which is fixed to the lay at that point.

It is impossible to use fixed shuttle guards on looms weaving warp pile velvets or where an embroidery attachment is fixed to the lay. Movable guards prevent the shuttle from flying out of its course by reason of the rod be-

ing fixed firmly to the top of the reed. This rod can be easily moved out of the way by hand. Fig. 8 shows the Bannister and Allinson type of this system. The rod, B, can

Fig. 4.

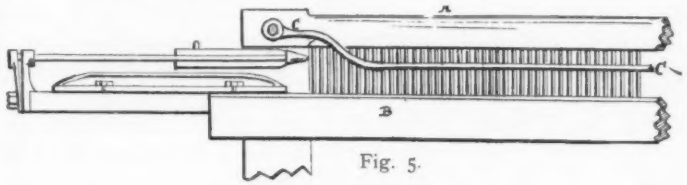


Fig. 5.

Fig 6.

Fig. 7

be swung in the supports, C C', and F. At one end a flat surface, D, comes in contact with a spring, E, and holds the guard in position when in use. The weaver can easily raise the rod, B, when it is necessary to tie in threads, etc. Before starting the loom the guard is swung back in working position. Hall & Sons' shuttle guard is similar to that just described.

Figs. 9 and 10 show the shuttle guard built by Joseph Hurst. It consists of two rods, A and B, parallel with the reed cap, C. These rods are fixed in the lever, D, the lay swinging on the bearing, F, and being held in position by the spring, E. The weaver can easily swing the rods to one side when it is desired to piece up ends or reach the reed for any other reason. The Ramblet and Clifton shuttle guard is built on the same principle as the preceding ones.

Fig. 11 shows the Marriott guard. In this device the guard consists of a plate about one inch high, and one-eighth of an inch thick. It is atached about 2 1/2 inches below the cap of the reed and about three inches from the reed. Two brackets B, are fastened by bolts to the cap of the reed. The guard plates, A, are connected with the brackets, B, by hinges, C. When the loom is stopped to repair the warp, the bolt, D, is lifted and turned against the cap of the reed. This system is very simple and not subject to any disarrangement.

The Societe Alsacienne des Constructions Mecaniques has adopted for its looms the guard shown at Figs. 12 and 13. It consists of a wooden strip, A, held in position by two supports, B. When the loom is running, the strip, A, occupies the position shown at Figs. 12 and 13, that is, at the extremity of the

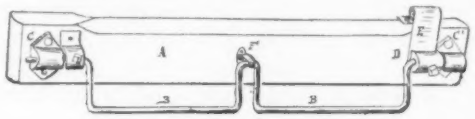


Fig. 8.

Fig. 9.

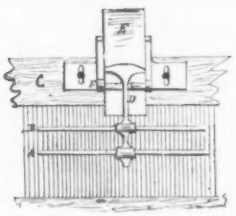


Fig. 10.

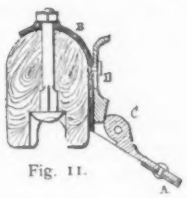


Fig. 11.

slot, E, in the supports, B. When the loom is stopped and it is desired to give access to the reed, the strip, A, is lifted and placed so as to rest in the notch, C. The wooden strip

falls into position as soon as the loom is started. It is the general opinion that this device will supplant all others by reason of its simplicity and efficiency.

The Sconfetti shuttle guard differs entirely from those we have been describing. It is shown at Figs. 14 and 15. On the cap of the reed is screwed the iron plate, B, on which are placed rings, R, which are joined at E. The distance between any two adjacent rings must be less than one-half the length of the shuttle. In weaving cottonades it is about 4 1/2 inches. When the loom is in motion the rings occupy the position shown at Fig.

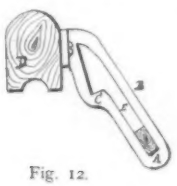


Fig. 12.

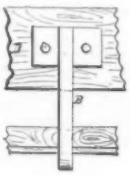


Fig. 13

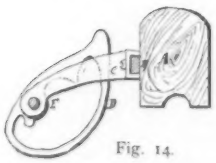


Fig. 14.

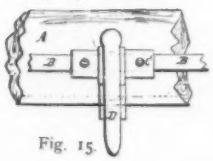


Fig. 15.

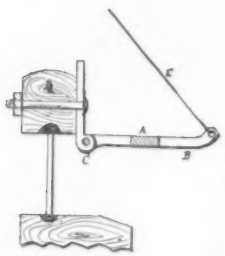


Fig. 16.

14, and if the shuttle should fly from its course it comes in contact with the rings and is restored to its proper position. To tie in threads the rings are turned on their axis, E, which gives access to the reed. This guard cannot prevent the shuttle from flying out of its course because the rings cannot be placed near the box without interfering with the changing of the threads.

Automatic shuttle guards are built so as automatically to move out of the way of the weaver when the loom is stopped. Fig. 16 shows a type of this guard. The guard plate, A, is supported by two levers, B, which turn on a bearing, C, in the plate fastened to the cap of the reed. The end of the lever, B, is connected with the frame of the loom by the

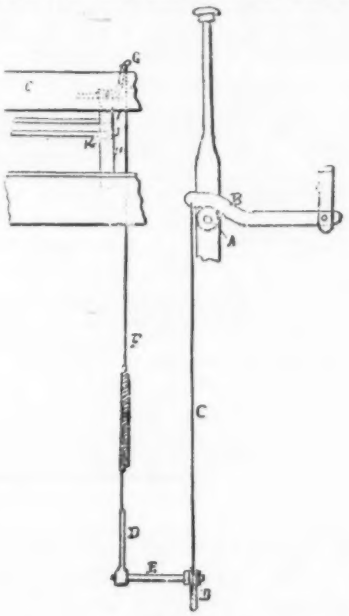


FIG. 17.

cord, E. By this arrangement the plate, A, occupies its correct position when the shut-

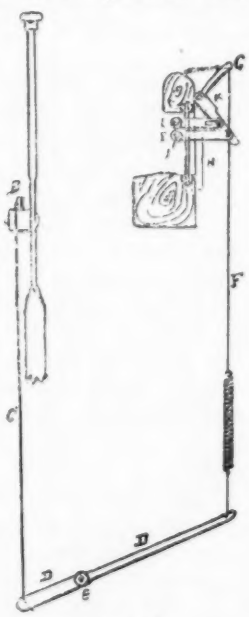


FIG. 18.

tle is passing, because at that moment the lay is the farthest back and the cord is slack-

ened. When it is necessary to piece up broken ends the lay is brought forward, the cord is thus stretched and the shuttle guard lifted out of the way of the weaver.

By the Farrell system the guard is in position while the loom is in motion and is moved out of the way as soon as the loom stops. Figs. 17 and 18 show the shipping lever with a stud, A, on which the bent rod, B, rests. When the shipper is moved to the right the lever, B, is raised. This lever is connected by a cord, C, to the shaft, E, and spring and cord F, with the shuttle guard. When the loom is running, the stud, A,

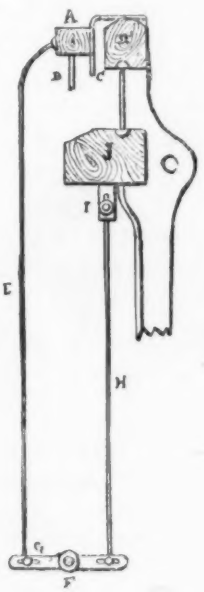


FIG. 19.

raises the lever, B, and this moves the shuttle guard into working position. When the loom stops, the lever, B, is lowered so as to throw the guard out of the way of the weaver.

Fig. 19 shows the Soutrenon shuttle guard which consists of a large cross piece, A, in which are convex teeth, B, the whole being fastened to the reed cap by the supports, C. As shown in the illustration this cross piece is connected with the lay, J, by rods and levers, E, G, H. By this arrangement the vibration of the reed is communicated to the cross piece, A. When the lay is back the guard is in position to prevent the shuttle from flying out; when it is brought upward the guard is moved out of the way so that the weaver can have access to the reed.

These automatic shuttle guards are used but very little, the principal objection to them being the high price and the liability to get out of order. Up to a short time ago the screens described in the first part of this article were considered sufficient by the inspectors, but lately they have expressed a preference for the shuttle guards. Most of the manufacturers favor the Sullivan guard which, while not always preventing the shuttle from flying out, yet has the advantage of being inexpensive and requiring but very little attention. It is evident that in its present state the question is incomplete and that in the near future the government will be required to specify more definitely the devices that should be applied to looms. (Translated by the Textile World Record from l'Industrie Textile.)

PURIFICATION OF WASTE WATER.

The problem of satisfactorily disposing of the waste waters from textile mills, bleacheries, paper mills and tanneries is a subject of very great importance and one that has received the attention of engineers and mill chemists for a number of years. In the early days of the above industries in this country no serious thought was given to the possible danger resulting from the contamination of streams with mill waste and, consequently, the custom of running such waters directly into the rivers became the rule rather than the exception. Since the industries have grown to such immense proportions as exist at the present day, such methods of waste water disposal are not considered, and the desire and intention of nearly all mills is to so divert it, or purify it, that its objectionable effects are minimized, or at least so reduced that Boards of Health, or other authorities, can raise no objections.

The proper purification of waste mill water, especially that from bleacheries, requires that the method of treatment shall be so thorough as to allow no injurious matters to escape,

and at the same time be cheap, and require no particular plant, or at most a plant that requires but little attention. The most economical method that can be devised consists of constructing a pair of vats or large tanks of sufficient capacity to retain the waste from the bleach works for, say, half a day, and at the moment of filling, to run in a solution of copperas (sulphate of iron) which almost immediately decomposes, setting free a precipitate of ferrous hydrate, and which carries down many impurities. Aluminium sulphate may also be used for this purpose, but its cost is likely to be slightly greater.

In the particular case of a bleachery, the proper process to adopt is based upon the character of the bleaching done, and the daily average volume of waste water, providing in the estimates a margin sufficient to cover occasional increases.

In the use of copperas the waste water, whether alkaline or acid, is decomposed, on the one hand, a precipitate of sulphate of calcium, with a separation of flocculent precipitate of oxide of iron. On the other hand, when the waste water is acid reaction, a similar reaction occurs, sulphate of calcium is precipitated, and basic iron salts set free.

Where the volume of water is very large, some difficulties may arise in the beginning, but in the case of smaller mills, no trouble need be encountered. The storage tanks should be of such size that the accumulated precipitates may be easily removed.

When the waste liquors are acid in character, very good results may be obtained by means of lime water, which not only neutralizes the free acid, but also precipitates the dissolved coloring matters and other impurities. This is also a cheap process, and the results, after removing the precipitate, in no way pollute the streams or rivers.

The cost of purification cannot be calculated unless there are given details regarding the character of waste water, average daily volume, and such other information as would aid in reaching a basis for estimate.

The English yard-pound is the single standard for numbering spun yarn throughout all English speaking countries, including the British colonies, China and Japan.

TEXTILE ADVERTISING THAT HAS SUCCEEDED.

[This is the fourth of a series of twelve articles, which will recount certain tangible success in the advertising of textiles along the lines advocated by the series of articles published last year. Last year Mr. Balmer discussed in a series of six articles, treating the necessity and possibilities of textile advertising, the planning of the advertising campaign, and general publicity and work upon dealers and follow these with a series of six other articles, each article being an investigation into the present state of the sales of six leading textile lines. This was theory, even though it was theory born of experience. The new series will treat of actual successes—no theory at all, but fact—something that has happened. They are living instances taken from every-day advertising life, and examples of the application of the theories that have formed the subject matter to the preceding articles.]

This is the story of the diamond-shaped label—the trade-mark on the products of the largest manufacturer of fine wash goods in America.

Some of the readers of the Textile World Record may not know to whom this refers; to such it is necessary for the value of this story that they should know something of this great concern—the Arnold Print Works of North Adams, Mass., which is located in this prosperous manufacturing city among the Berkshire Hills of Western Massachusetts.

We will not try to describe the works or the wonderful machinery that has given them their pre-eminence in mechanical processes, or their highly developed designing plant where they originate from the best of all the world's suggestions in high class fabrics, in designs that are marvels of beauty, printed in colors that bear a stamp of perfection that places them beyond competition.

In their print works and mills located at North Adams, they employ more than 3,200 people, and from the thrown silk and cotton in the bale, turn out a product of more than eight million dollars annually.

In this introduction I can say no more that would express the standing of the Arnold Print Works in the business world.

Without attempting to write an eulogy of the officers and directors of this great corporation, whom I have met in a business way, I am bound to say that it has never been my good fortune to meet gentlemen more progressive, broad-minded, liberal and tolerant of other people's ideas, seeking for everything new that promises more prosperity with honor for the concern which entrusts them with the direction of its affairs.

Early in the year 1904, a mutual friend told the writer that he believed the Arnold Print Works could be interested in advertising.

Arnold Fabric Talks
Arnold Superfine Organdie
SUPERFINE ORGANDIE
Arnold Grecian Voile
GRECIAN VOILE
Made from Superfine Organdie
Made from Grecian Voile
Send Postal To-day for the new Arnold Magazine of Fabrics and Fashions. It contains many superb plates of exclusive advance styles for Spring, in street costumes, house dresses and evening gowns, and tells, besides, of the great Arnold line of Spring fabrics.
ARNOLD PRINT WORKS, Dept. B
40-42 Leonard St., New York
ARNOLD

At a dinner given in Boston in May, 1904, by Franklin P. Shumway to the manufacturers of New England, I had the pleasure of sitting as one of four guests at the same table with a director of the Arnold Print Works, and for the first time had the opportunity of talking to him on the subject that was nearest to my mind.

From this beginning I had the pleasure of being called into the confidential counsel of the Arnold Board, and may say that few, if any campaigns in advertising, received more careful, temperate, patient consideration than the one that was proposed by the Butterick Publishing Company and finally accepted by the Arnold Print Works. There was no effort made to be erratic, remarkable or peculiar in what was done; the only things that would appeal to them were to do everything modestly and as well as it could be done.

But to come back to my story of the diamond shaped label. Strange as it may seem, this great manufacturing concern had never adopted a distinctive trade-mark as applied to their products. This all important matter was happily solved by the adoption of the diamond trade-mark shown at the head of this article. As the diamond is the choicest of gems it is specially a fitting mark for the highest qualities of textile productions and was first brought to the attention of the consuming public in the magazines of February 1905.

I am not interested in telling you exactly

Arnold Fabric Talks
Fil de Soie
FIL DE SOIE
MOHAIR LUSTRE
Arnold Mohair Lustre
Send Postal To-day for the Arnold Magazine of Fabrics and Fashions. It contains many superb plates of exclusive advance styles for Spring, in street costumes, house dresses and evening gowns, and tells, besides, of the great Arnold line of Spring fabrics.
ARNOLD PRINT WORKS, Dept. B
40-42 Leonard St., New York
ARNOLD

what advice was given to the Arnold Print Works as to the conduct of their advertising campaign, what they did, how they did it and what it produced; as this is less important than the fact that advertising has secured a new ally—the greatest of the textile manufacturers of cotton and silk dress fabrics in the world, and it proves again that the consider-

ation of advertising is worthy of the greatest minds in this country, those who manage the greatest businesses, because it can safeguard and assure them prestige as nothing else can.

Some will say, "But what did they get out of it?" If the Arnold Print Works have it to tell they have not told it; if I would like to know it, I have not asked it. What does any sane man expect to get out of an initial campaign in advertising, the adoption of a new trade-mark and acquainting the consuming

Arnold Fabric Talks
Through the generations which have passed, one nation after another, from the refining influence of civilization and education, has excelled in its textile productions and supplied the markets of the world.
America, the youngest in the family of nations, has by its wonderful development of material prosperity, afforded an attractive market for the looms of the Old World which have held supremacy in supplying the needs of American women in the finer sorts of goods.
In fabrics made of Cotton, and Silk and Cotton, this is no longer true.
The Arnold Print Works and Miles have made such extensive improvements in recent years that their product of fine goods, made in quantities sufficient to clothe the continent, are winning the admiration of American women by their fineness of texture, beauty of style, perfection of finish and durability in wear.
To bring these facts to the attention of ladies who wish to secure the newest and best of Spring and Summer fabrics has been the object of our "Fabric Talks" which have appeared in the home and fashion magazines in recent months. Please look for our trade-marked ticket on the outside wrapper, which guarantees your satisfaction.
Every Dry Goods Store in city or country will send you samples, or show you our new trade-marked goods on request.
The Fil de Soie Model
The Arnold Magazine of Fabrics and Fashions
ARNOLD
FIL de SOIE
Cut This List Out
Arnold Print Works, Department B, 40-42 Leonard Street, New York

public with such a tremendous range of fabrics in the first year, except an indication as to the possible outcome by persistency in the pursuance of the same policy or an improvement on that policy.

This is not a story of the success of the Arnold Print Works advertising; it is simply to tell of the kind of new advocates that are coming into new advertising on the new way and to record the fact that when they do come in they want to do the very best that can be done on the highest plane and for the best interest of the jobbing trade, through whose facilities the retail trade is enabled to supply the needs of the consuming public.

It never has been difficult for the dry goods jobber to sell the products of the Arnold Print Works, but it is an open secret that it was never easier to do than it has been to sell their widely advertised trade-marked products this year.

It has been proved over and over again in the passing season that the sale of these goods, being pushed by the retailer, not only increased his sales and profits, but was the means of making him more conspicuous as a dealer in the highest grade of goods and brought business from the satisfied buyers of the Arnold trade-marked fabrics for other lines of goods in his store.

The underlying idea of this whole Arnold Print Works advertising campaign was their diamond-shaped trade-mark, which was to

Arnold Fabric Talks
ARNOLD
Cut This List Out
AND ASK YOUR DEALER TO SHOW YOU
Arnold Print Works, Department B, 40 and 42 Leonard Street, New York

become the distinguishing label of their unequaled fabrics and a thing worth making known to the world.

The one interesting fact about their advertising to me is, that to secure their ends they used large space and comparatively few magazines and those most suited to their class of business and for the details of the methods they employed they acknowledge in a generous way the appreciation of the advice and assistance they received from the Butterick Publishing Co. Thomas Balmer.

TEXTILE PROCESSES.

EDITED BY E. A. POSSELT.

MANUFACTURE OF SILK FROM FIBRE TO FABRIC.

IX.

SILK THROWING

is the technical, but vague term used to include the various processes of winding, twisting, doubling, and re-twisting raw silk. For most uses, and weaving purposes in particular, several raw silk threads are united to form a new thread by doubling or twisting (throwing) together, each of the component threads (singles) having been previously twisted in order to increase its strength and give it greater roundness. The twist is in the opposite direction to that given in the doubling process.

SINGLES

also termed dumb singles, is made by simply doubling two or more raw silk threads and winding, without twisting, them together. This silk produces a very soft and lustrous silk fabric which cannot be equaled with twisted yarns.

ORGANZINE

for warps is produced from the best cocoons, tram or trama from those of lower quality, and spun silk from the lowest grades, spoiled cocoons, refuse, waste, etc.

TRAM

is the union of two or more single threads, without twist, doubled in one operation, and afterwards slightly twisted together, the object of this being simply to form a more compact thread. It is used chiefly for filling.

ORGANZINE

is the union of two or more single threads separately twisted in one direction, and then doubled as in tram, and re-twisted in the reverse direction. It is used for the warp. The two processes of twisting are imparted solely for the purpose of obtaining the degree of firmness and compactness necessary to withstand the action of the loom. Every twist beyond what is necessary is detrimental to the peculiar and exceptional beauty of the material.

HARD OR RAW SILK

is silk from which the gum has not been extracted.

SOFT SILK

is the technical term for silk in which the boiling off or ungumming is made complete, silk losing by this process from 24 to 30 per cent. of its original weight.

SOUPLE SILK

is silk from which only a part of the gum has been removed, this silk in this instance losing only from 5 to 12 per cent. of its weight. This silk is not as soft after the process as in the case of the completely ungummed silk.

ECRU SILK

is silk which has had only a small portion of the gum removed, the loss in weight of the silk, due to the removal of the gum, being from 2 to 5 per cent. of its weight.

SCROOP OF SILK.

Silk that has passed through an acid bath gives out, when rubbed or squeezed, a peculiar grinding sound known as scroop.

SPUN SILKS, EMBROIDERY SILKS

and twisted or corded silks require longer boiling than thrown silks; it usually takes from 1 1/2 to 2 hours' boiling to remove the gum completely.

Often, silk after it has been boiled off, retains a faint yellow tint, which can be removed either by sulphuring, or stoving, bleaching with peroxide of sodium or alkaline bisulphites, or by tinting.

RAW SILK

is white, pale or dark yellow, or occasionally reddish, the coloring matter being contained in the external layer, so that when this is removed the silk is white.

The different kinds of silk are distinguishable by their diametrical dimensions, and by the more or less decided appearance of longitudinal stripes, or by polarization colors. In examining raw silk it is advisable to first boil the sample in a solution of soap.

CHAPPE SILK,

also known as spun silk, from silk spinner's waste and from inferior cocoons, is difficult to distinguish from pure silk under the microscope. It can be differentiated, with more or less accuracy, by the irregular form of the thread, and especially by the remarkable irregularity of the surrounding envelope of sericin or gum.

The Rontgen or X-rays have also found a field of employment in the silk industry. They have already been used to select cocoons and enable the observer to ascertain, without opening the cocoon, if the animal inside is of male or female sex. The eggs which the female carries contain enough mineral matter to be detected by the process. The X-rays can also be used to determine whether the silk has been weighted, and to what extent. As the weighting is done in black silks with salts of iron, the presence of these is easily discernible, and this method of detection may be employed in addition to the more complicated chemical analysis, or in place of it.

TUSSAH SILK.

In India, tussah silk has various names indicative of varieties, such as Tasar, Tasar-Muga, Data, Laria, Bogai, etc., the four latter being applied to varieties of cocoons. In this country and Europe it is known as Tussore, Tussah, Tusser and Tussur, its general name in India being Tasar, the "a" being pronounced as "u," it is therefore perhaps more correctly Anglicized as tussur, which gives its exact pronunciation. This name is said to be derived from Tasara, a weaver's shuttle. The differences in the fibre structure of tussah silk from that of the ordinary raw silk of commerce, the product of the bombyx mori silkworm, is very considerable. The width of the single or ultimate fibre of tussah silk is about the 750th part of an inch, and in this narrow width there are about 20 small fibres of fibrilla lying longitudinally, and connected with each other by a hardened fluid seriposited at the time the worm forms this silken thread.

Eria silk is closely related to Tussah silk, being produced from the recinus moth, a native of India.

Fagara silk is the product from the Atlas moth, the largest nocturnal moth known, and a native throughout Eastern Asia. The cocoon is light brown in color, being open at both ends, so that the moth can escape without injuring the cocoon filaments. This silk also resembles Tussah silk.

Yamamai silk is obtained from the Japanese oak leaf moth of this name, and compared to the other wild silks most nearly resembles cultivated silk, though it is somewhat coarser than the average cultivated silk, its diameter being about 0.001 inch. This silk worm spins an unusually regular cocoon of a beautiful pale green color, and from which the silk can be readily reeled.

In California, a wild silk-moth is found thriving on the poisonous species of Rhamnus californicus. It produces a silk nearly as good as that of the cultivated silkworm, and owing to the favorable nature of the climate, without the frosts or rains of China and Japan, has great prospects.

WILD SILK COMPARED TO TRUE SILK.

Wild silk is distinguished from the silk of the bombyx mori, i. e., true silk, by the longitudinal striations seen in each of the double fibres when under the microscope, and by the apparent contraction of the fibre at certain points. The former are due to the fact that the wild silk fibre is composed of a large number of fibrils, while the latter appearance is seen because more or less flattened fibres are twisted at the contracted points.

TESTS FOR SILK.

It certainly remains for the manufacturer, one of the most important items, to convince himself of the character of a lot of silk under consideration, before dyeing; again he may be called upon to examine samples of yarn or fabrics submitted with reference to character and quality of silk used in its construction, for which reason characteristic points of the various silks as well as tests for dis-

tinguishing silk from other fibres thus given will be found of the greatest advantage.

Under the microscope silk appears as a smooth (more rarely stripe) cylinder without any contents; in contradistinction to vegetable and wool fibres both lumen and scales are lacking. Mostly the silk appears as a double thread.

Silk dissolves with difficulty in soda and potash solutions; sugar and sulphuric acid dissolve it with a rose-red coloration (albium reaction), hydrochloric acid with violet coloration. A concentrated solution of zinc chloride, 138 deg. Tw. (sp. gr. 1.69), made neutral, or boiled with excess of zinc oxide will dissolve silk slowly if the solution is cold, but rapidly if heated, in turn forming a thickened gummy liquid. Other solvents for true silk are: ammoniacal copper oxide, ammoniacal nickel oxide and caustic potash or soda, it (silk fibre) however being precipitated in the addition of water.

Silk fibres may be distinguished from cotton, linen and other vegetable fibres by curling up when exposed to a flame similar as wool, but since the fibre contains no sulphur, no smell of horn is evolved, otherwise it contains all the other elements present in wool, viz., carbon, hydrogen, oxygen and nitrogen.

Silk can be distinguished from cotton by alkalinizing a solution of fuchsine, by adding drop by drop a liquor of potash or caustic soda. The moment the liquor gets discolored, the threads to be tested are immersed and lifted after half an hour and carefully washed. Under this treatment silk threads or fibres become red, whereas cotton threads or fibres remain colorless.

To separate silk, cotton and wool in a sample containing these three fibres, remove the size and dye, as previously explained, and in turn treat the sample with ammoniacal nickel oxide, which dissolves the silk at once. The cotton in turn is then dissolved from the remaining portion of the sample by means of ammoniacal copper oxide, leaving the wool behind.

To ascertain the percentage of each in a sample composed of silk, cotton and wool, two samples of yarn, each weighing 2 grams, are dried, weighed and boiled for a quarter to half an hour, in 200 c.c. of 3 deg. B. hydrochloric acid, to remove the size and dye, and are then thoroughly washed and pressed. One sample is then immersed for a short time in a boiling solution of basic zinc chloride, then washed thoroughly, first in acidified, afterwards in clean water, then dried and weighed, the difference in weight giving the amount of silk. The second sample is then boiled for fifteen minutes in 60 to 80 c.c. of caustic soda (sp. gr. 1.02), and then washed, dried, and weighed, the difference in weight representing the proportion of wool. The residue is cotton, the dry weight of which must be augmented by about 5 per cent. to compensate for the corrosion of the fibre during the operation.

To separate silk, tussah silk, wool and cotton in a sample, have the sample first acted on by boiling half a minute with concentrated hydrochloric acid, which immediately dissolves the silk, the tussah silk being dissolved at the end of two minutes further boiling. On treating the remainder of the sample with hot caustic potash, the wool will then be dissolved and the cotton left.

ARTIFICIAL SILK.

The same is the product of treating cotton or other cellulose material with a mixture of nitric and sulphuric acid at a low temperature, which converts it into nitro-cellulose, which is then dissolved in a mixture of acetone, acetic acid and amyl alcohol, equal volumes of each of the three components giving the best results. This substance is expressed from capillary orifices, and instantly solidifies on contact with the atmosphere, by reason of the evaporation of the acetone, and forms solid, silky, lustrous threads, which in turn are reeled, doubling two or three ends. Artificial silk in this state is an inflammable and explosive product, due to the presence of the nitrocellulose, and this has to be remedied to render it safe for use. For this purpose suitable reducing agents, such as hydrosulphurous acid, ammonium sulphydrate, etc., are employed in order to reduce the nitro-cellulose, to totally or partially denitrated cellulose, according to the length of the reaction. The hanks of threads are immersed in the solution for several hours, then washed in pure water and suitably dried. The coloring of the threads is done when

preparing the mixture for making the thread.

A late form of spinning appliance for artificial silk is explained in connection with the accompanying two illustrations, and of which Fig. 1 is a side elevation of the apparatus and Fig. 4 a front view of the nozzles, one of which is shown partially in section so as to convey an idea of the course of the solution through the apparatus.

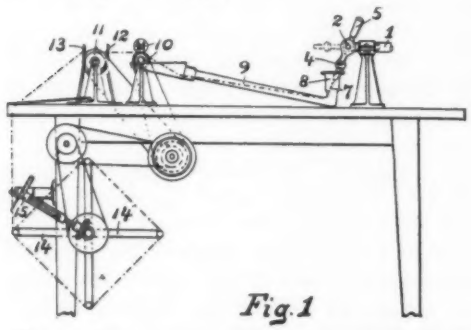


Fig. 1

The tube, 1, to which is supplied the liquid to be converted in turn into strands of artificial silk, is connected with a transverse pipe constituting two hollow cones, 2, set horizontally and in line with each other. Each cone, 2, is closed at its outer end, whereas its central passage terminates in a lateral opening, 3, through which the solu-

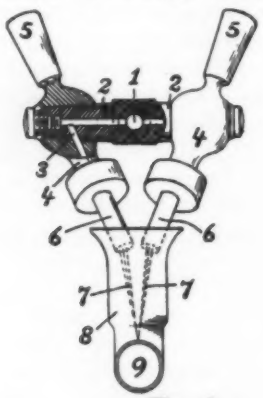


Fig. 2

tion is made to discharge. These cones, 2, constitute fixed plugs, and have mounted upon it nozzle holders, 4, furnished with handles, 5, for thus working the same handily into the required position on the plugs, with which these nozzle-holders, 4, form taps. When each nozzle-holder, 4, is depressed, the same is in communication with its conical plug, and the tap is then open, whereas when said nozzle holder, 4, is raised, communication with the plug is cut off and the tap closed. The nozzles carry at their extremity a glass die, 6, pierced with fine holes, through which the composition for the artificial silk under pressure is discharged in the form of fine strands or fibres, 7. These nozzle holders, 4, are fitted at an oblique position to the axis of the cone plugs to which they are fitted, so that the dies can approach each other and discharge streams of fibre into a glass vessel, 8, placed to receive them. This vessel, 8, in turn is formed in one with a conducting tube, 9, which inclines slightly upwards towards its free end, and is open for the discharge of the strands. The vessel and its conducting tube are charged with a liquid suitable for the extraction of the solvent from the material used for producing the strands or fibres, and during the passage of the threads through the tube, 9, the main part of the solvent is extracted and the viscous mass of fibres converted from a plastic to an almost solid state in which it is easily handled.

The strands, 7, as they leave the tube, 9, are drawn out by a pair of nipping rolls, 10 (see Fig. 1), so as (1) to reduce the diameter of the combining strands, (2) to squeeze out the adherent liquid, and (3) to increase the brilliancy of the fibre. The thread thus formed is then led on to the cylindrical roller, 11, mounted between two fixed guides, 12 and 13, which respectively lead the thread, 7, on to, and off the periphery of the roller, 11, which serves as a rotating bed for supporting the thread, 7, imparting simultaneously a slight twist thereto, to prevent the fibres composing the thread from separating during the subsequent operations of hardening, spooling, final twisting, etc. The thread thus far constituted is then drawn off from the apparatus, and in turn guided on a reel, 14, mounted on the frame work of the table which supports the apparatus, the rotations of which reel are registered by suitable counting apparatus, 15. The strands, 7, are carried over a cylindrical surface rotating in a plane parallel to the direction in which the strands are drawn out. The friction roller, 11, serves for carrying

and stretching the strands, as well as for connecting the different fibres as constituting strand, 7, by friction twisting into a compact thread. In starting the apparatus the thread is first drawn straight from the first guide, 12, and when the spinning has been fairly started it is placed in the second guide, 13, as is placed out of a straight line; the effect being that the thread, while entering upon the roller, 11, in a direction parallel to its own rotation, is drawn off at a slight angle, thereby receiving a gradual false twist which serves for the combining of the separate strands or fibres. The friction surface must have a speed of rotation equal to the delivery of the thread from the squeezing rollers, so that the thread does not get unduly stretched after it has passed from a plastic into a solid state.

In view of the considerably lower value of the artificial silks, it becomes important that we should possess means of identifying these also.

The most suitable indications are the chemical and physical characteristics; for example, the inferior strength and elasticity of artificial silks, and their deficiency in the "crackling" feeling observable in handling true silk.

Artificial silk burns quickly, like cotton, and leaves no appreciable ash. The sp. gr. of artificial silk is 1.490, whereas that of the natural silk ranges between 1.357 and 1.367.

Artificial silk appears under the microscope as a structureless, vitreous rod, as compared to the two cylindrical fibres or brins characteristic to true silk.

When dissolved in caustic potash they produce a yellow (pure silk a colorless) solution, and they are insoluble in an alkaline solution of copper containing glycerine. These properties render the quantitative separation of artificial and natural silks possible.

(To be continued.)

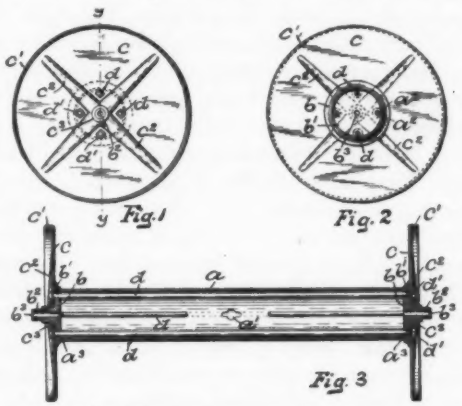
DEGUMMING SILK WASTE.

In the May instalment of the series of articles on The Manufacture of Silk from Fibre to Fabric, appeared a description of a process of degumming after which the waste was manufactured into yarn and fabrics. We have since learned that the process described is covered by patent 672,055, granted to Daniel E. Coe, April 16, 1901, and cannot be used without arrangement with the patentee.

A NEW CONSTRUCTION OF A WARP BEAM FOR LOOMS.

The object aimed at in the construction of this warp beam is to lighten and at the same time strengthen the same, in turn producing a most rigid and durable warp beam.

The new warp beam consists in a sheet and



metal cylindrical drum, with sheet metal ends and fittings forming the end shafts, each having a circular concentric groove for receiving the ends of the cylindrical drum. Bolts extending through the ends, fittings, and drum, secure the various parts thus referred to, in one rigid and durable structure.

Of the accompanying illustrations Fig. 1 is an end view of the warp beam, showing the stamped up flange and ribs for strengthening the end. Fig. 2 is a transverse sectional view taken through the warp beam, and Fig. 3 is a longitudinal sectional view taken on line Y, Y, of Fig. 1.

A description of the construction of this warp beam is best given by quoting letters of references accompanying our illustrations and of which a indicates the sheet metal cylindrical drum, b the end fittings, c the sheet-metal ends, and d the fastening bolts. The cylindrical drum, a, is formed from a sheet of metal, having the hole, a′, by rolling the sheet and bringing the abutting edges, a^2, together, forming a cylinder having the

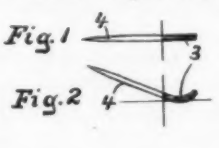
open ends, a^3. The fittings, b, are made in the form of a disk, each having the concentric circular groove, b', in their inner face for the ends, a^3, of the drum, a, and the outwardly extending shafts, b^2, having the central longitudinal holes, b^3, as shown in Figs. 2 and 3. The circular ends or beam heads, c, are stamped from sheet metal, each having the flange, c', the radial strengthening ribs, c^2, and the central hole, c^3, for the shafts, b^2, as shown in Figs. 1 and 3.

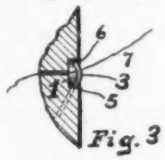
The fastening bolts, d, for holding the various parts as composing the warp beam together, extend lengthwise through the drum, a, holes in the fittings, b, and the ends, c, and secure the ends, a^3, of the drum, a, in the circular concentric grooves, b', in the fittings, b, and the sheet metal ends, c, to the fittings by the nuts, d', as shown in Fig. 3. The warp beam is supported by the shafts, b^2, in bearings on the loom, or by a rod through the longitudinal holes, b^3, in the shafts, b^2. At work, the end of the warp threads are knotted and secured to the drum, a, through the hole, a', in the drum. The cylindrical drum, a, can have a plurality of holes corresponding to the hole, a', and can be of most any length required.

AN IMPROVEMENT TO HAND-THREADING SHUTTLES.

Such shuttles require an open passage cut through the shuttle side terminating in the delivery eye. In connection with such shuttles it will be noticed that on account of the twisting effect upon the thread while rapidly unwinding from the bobbin and to the high speed reciprocatory movement of the shuttle, the thread in doubling at each pick of the shuttle is more or less apt to twist itself out of its passage way provided for it in the shuttle, and this with the result of breaking, and in turn stopping of the loom, and consequent loss in production. The purpose of the new device to such a loom shuttle of the hand threading kind, is to prevent the thread leaving the delivery eye after it has been once led into it, until the thread has run out (as we might say) on the bobbin. The device for accomplishing this result consists in a bar provided to the outlet eye of the shuttle, and which bar, in turn, we will describe more in detail with reference to the accompanying illustrations of which Fig. 1 is a detail view of this longitudinal bar, the exposed portion being shaded. Fig. 2 is a detail lateral view of the same bar as shown in Fig. 3, which shows in section that portion of a shuttle adjacent to its terminal outlet. Fig. 4 is a section of a shuttle side immediately around the terminal outlet, showing the longitudinal bar arranged for left hand shuttles, whereas Fig. 5 is a similar section showing the bar arranged for a right hand shuttle.

The improvement as compared to usual makes of shuttles of the hand threading type consists in sinking a recess, 1, around the terminal eye of the shuttle, and withdrawing the end of the terminal tube or eye to the bed of the recess, which is made U-shaped in order to provide an overhanging shelf, 2.





beneath which and above the outlet eye a longitudinal bar, 3, is arranged across the recess. This bar, 3, is made with a shank, 4, which is driven into the shuttle body or the recess walls, as at 5 on one side of the vertical passageway for the thread in the shuttle. The bar, 3, is then carried longitudinally across the vertical passage substantially at right angles to it and terminates, as at 6, as closely to the opposite recess wall as will allow a thread, 7, to pass around its point. The bar, 3, is also spaced sufficiently below the overhanging shelf and from the bed of the recess to allow a thread to pass over and behind it. Longitudinally the exposed portion of the bar is straight. The shank, 4, of this bar, 3, may be bent in any direction best adapted to secure it in the shuttle body. Laterally the exposed portion of the bar is slightly curved inward, so as to terminate its

point below the edge of the recess walls of the shuttle, and outward where it crosses the vertical passage, so as to lift the thread, 7, as it sweeps along the shuttle side over the corners, 8, of the vertical passage where it intersects the recess walls of the shuttle.

Since the torsional twist given the thread in unwinding at high speed from the bobbin gives it a tendency on meeting any bar or wire to run in opposite directions in right or left hand shuttles, this action is taken advantage of in the new shuttle by making the fast end of the longitudinal bar at the side of the recess toward which the thread will travel in either shuttle. (See Figs. 4 and 5.) Thus the tendency of the thread will be run away from the points of the bar, 3, toward its closed end, 4, where it is held fast, and the thread will not escape from the eye of the shuttle.

The action of threading a shuttle provided with the new device explained is thus: a single pull of the thread into the vertical passage of the shuttle causes it to encounter the bar, 3, and when the slight inward curve slips it over the point, and the shuttle is threaded. The rise of the side walls from the bed of the recess near which the point of the bar terminates (see Fig. 4 or 5) then prevents its getting under the point again, the outward lateral curve raises the thread over the corners and edges of the vertical slot, and if by a remote contingency the thread should enter the vertical slot its travel along the bar, 3, will lead it to the closed end, and the next pick will return the thread to its working position in the outlet of the shuttle.

HOW TO PRODUCE A PERFECT VELVET FINISH ON FANCY CASSIMERES.

This finish depends considerably upon the fulling mill to give to the fabric the felt necessary which afterwards, by means of suitable gigging, napping, brushing, etc., is transformed into the soft velvety-feeling nap, so essential a feature of this finish. A dense nap is required, and to insure this, the felt must be reasonably close and perfect, as it is from the felted surface of the structure that the nap must be raised, and not from the threads, since otherwise a tender fabric will be the result. The amount of the felt produced depends, as we might say, entirely upon the quality of the wool used in the construction of the fabric; for which reason the perfect final finish chiefly depends upon the careful selection of the stock, although to a certain extent the weave, and the twist of the yarn must be carefully taken into consideration.

Never use a long stapled wool, for the fact that it is the protruding ends from the warp and filling as used in the construction of the fabric, which must produce the characteristic nap to the fabric, and the more of these protruding ends there are in the yarn the thicker the nap possible to be raised from it. It is for this reason that the use of shoddy, if carefully selected, will be permissible, that is provided the best grade possible to procure is used, since such actually may help toward producing a density of nap, provided the life and felting quality of said shoddy are not impaired. However, it must be strictly understood that we refer only to an "all wool shoddy"—live fibres—not shoddy produced from ragstock previously fulled, or possibly such as containing a percentage of cotton, and which if used will give a less satisfactory result, since the cotton fibres, having no felting quality, will give less body to the fabric structure, for the gig in turn to work upon.

If the fabric structure under operation will permit it shrinking slightly in length during the process of fulling this will be of great help in producing the required result. After the proper fulling of the structure is obtained, cleanliness and freedom from all trace of soap is necessary, remembering that the use of fuller's earth at the final rinsing should never be omitted, for this will impart to the goods a certain soft and silky feeling which cannot be obtained in any other way. When this part of the work has been satisfactorily performed, and the goods are ready to come out of the washer, take them at once to the rolling and stretching machine and roll them on tight and smooth.

After leaving them stay on rolls over night, they then are in the best possible condition for the gig, free from creases or

wrinkles, and just about right as to moisture.

Provided the fabric reaches the gig in too dry a state, then during the process of gigging some of the fibres will be torn by the teasels, out of the fabric structure, and be wasted in gig-flocks, instead of contributing to the perfection of the nap. Besides this there will be a danger of the teasels cutting the threads, whereas a proper moisture serves to protect them.

Upon the proper gigging depends the entire success of this velvet finish, provided the proper selection of stock, weave, fulling and scouring have been properly attended to.

In starting the gigging, always begin with old worn teasels, rapidly increasing to sharper work and this with frequent reversing. Select your change in sets of teasels used in such a way that they will pick-up the fibres from the felt easy, i. e., that we are not compelled to apply the cloth too hard to the teasels, thereby causing them to drag forcibly and in turn lay the nap. For this reason use teasels sufficiently sharp so they will raise the nap by a moderate fabric contact only. Always apply the cloth lightly to the teasels to get this velvet nap, changing the work as soon as the teasels fill up with flocks, for it must be remembered that the finish desired is "a standing nap," on the order of a plush, in place of a laying the nap, as required in connection with fabrics like beavers; a feature prevented by the frequent reversing of the goods or of the motion of the cylinder of the gig, as the case may be. If two cylinder gigs are used, run the cylinders in opposite directions. When towards the end of the process the nap becomes very thick, then the cloth must be put on considerably harder in order to have the teasels work through this heavy pile, constantly raising new pile from the bottom of the structure.

To determine when the goods are sufficiently gigged, the felt on the face of the cloth must have been raised so that the threads and pattern will show up clearly when the nap is parted or cut away. The latter half of the gigging process must be done more moist than is usually the case in connection with other finishes, and therefore the goods must be evenly and generously sprinkled.

Do no work after turning the fabric the last time, except to barely turn the nap, finishing the clearing up and thus the process of gigging proper, before the cloth is thus turned the last time.

If dealing with a napping machine in place of a gig, then the first run on this machine must be given reversed, and subsequent runs the right way. The workers of the napper must be run at their highest speed, and after the goods have had two runs, bring the cloth in contact with the worker as far as can be done safely, and use the sprinkling can without stint. Two runs thus given should leave the goods in good condition.

After the gigging or napping is completed, the goods are taken to a brush gig, which practically is a wet gig with all its appointments as to water supply, whereas its cylinder is clothed with wood-fibre brushes. The pieces are here given at least four runs with lots of water, and then rolled up again on the gig and left again until next morning, when they are folded off and extracted for the dryer, which should be speeded sufficiently slow to do the work without stopping, since in the latter instance the pressure and heat of the rolls are liable to mark the goods, by the nap being pressed down and thus set, and when afterwards the brushes of the shear cannot raise the nap on such places of the fabric properly, for the shear blades afterwards trimming the nap uniformly at such points.

After drying and before shearing, the cloth should be given a few runs upon an up-and-down gig, and this with fairly good teasels, a process which will give to the nap a lofty effect by lifting and thus softening it up, correcting at the same time any tendency of the nap to lay in the wrong direction by the slight work given it on the last turn of the wet gigging. In place of this dry gigging, some finishers prefer the brush, using in connection with this procedure a little steam, which will loosen all the fibres and assist the brushes on the shear, then to do their part of the work more effectually. During this shearing, care must be exercised to get the nap of the goods even and also not too low, for while the goods are to show the pattern plainly, they at the same time must have a nap left on them to give them the soft vel-

vety feeling. Never stint the goods in the number of runs, for they will look all the better for it. The raising brush as on the shear should not be set too hard, or the result will be to turn the nap back too far, instead of causing it to stand, so that the shear blades can do their work properly; again the back or laying brush must be clear, and well applied, so as to thoroughly lay the nap at each run. Do not shear the fabric too close.

If specking is necessary, it should be done now, giving the goods again a brushing before they are inspected, after which they are again steam brushed, and in turn are then ready for the press. They are pressed with the face to the bed as hard as possible and are then given a steam brushing. The amount of steam used should be very light, and the brushes also should not be on too hard. The number of runs to be given here depends upon the conditions of the goods as required in the market. The goods then present sufficient smoothness so that we can easily distinguish which way the nap was finished; however, the fabric will be free from any harshness in handle, present a most beautiful face and at the same time be up to strength in its structure.

NOVELTIES FROM FOREIGN SOURCES.

Worsted Suiting.

Complete Weave.
Repeat 2×2.

Warp :—2840 ends, 8 harness, straight draw.

Reed—22½×2=63 inches wide in loom.

Dress :—

1 end,	2/30's worsted, slate and white, twisted over with single 100's mercerized cotton.		
6 ends,	2/52's worsted black, and 50's light blue twisted over with single 100's mercerized cotton.	× 6=	48 ends
1 end,	2/52's worsted, black and orange, twist..		
1 end,	2/30's worsted, slate and white, twisted over with single 100's mercerized cotton.		
7 ends,	2/52's worsted black, and 50's light blue twisted over with single 100's mercerized cotton.	× 2=	16 ends
1 end,	2/30's worsted, slate and white, twisted over with single 100's mercerized cotton.		
3 ends,	2/52's worsted black, and 50's light blue twisted over with single 100's mercerized cotton	× 2=	16 ends
1 end,	2/52's worsted, green and red, twist.....		
3 ends,	2/52's worsted black, and 50's light blue twisted over with single 100's mercerized cotton.		
1 end,	2/30's worsted, slate and white, twisted over with single 100's mercerized cotton.		
7 ends,	2/52's worsted black, and 50's light blue twisted over with single 100's mercerized cotton.	× 2=	16 ends
		Repeat of pattern:	96 ends

Filling :—48 picks per inch, arranged thus:

1 pick,	2/30's worsted, slate and white, twisted over with single 100's mercerized cotton		
6 picks,	2/52's worsted black, and 50's light blue twisted over with single 100's mercerized cotton.	× 7=	56 picks
1 pick,	2/36's worsted, black		
1 pick,	2/30's worsted, slate and white, twisted over with single 100's mercerized cotton		
7 picks,	2/52's worsted black, and 50's light blue twisted over with single 100's mercerized cotton.	× 2=	16 picks
1 end,	2/30's worsted, slate and white, twisted over with single 100's mercerized cotton.		
3 ends,	2/52's worsted black, and 50's light blue twisted over with single 100's mercerized cotton.	× 2=	16 picks
1 end,	2/52's worsted, black and orange, twist..		
3 ends,	2/52's worsted black, and 50's light blue twisted over with single 100's mercerized cotton.		
1 pick,	2/30's worsted, slate and white, twisted over with single 100's mercerized cotton		
7 picks,	2/52's worsted black, and 50's light blue twisted over with single 100's mercerized cotton.	× 2=	16 picks
		Repeat of pattern:	104 picks

Finish :—Worsted finish, 56 inches wide.

Worsted Suiting.

Complete Weave.
Repeat 2×2.

Warp:—2615 ends, 8 harness straight draw.

Reed :—20½×2=64 inches wide in loom.

Dress :—

end,	2/56's worsted, red-brown (double)	=	1 end
end,	2/56's worsted, brown and white, twisted over with 28's worsted brown		
1 end,	2/28's worsted, fancy olive mix	×14=	28 ends
2 ends,	2/56's worsted, brown and white, twisted over with 28's worsted brown		
2 ends,	2/28's worsted, fancy olive mix	× 6=	24 ends
1 end,	2/56's worsted, brown and white, twisted over with 28's worsted brown		
1 end,	2/28's worsted, fancy olive mix	×13=	26 ends
1 end,	2/56's worsted, brown and white, twisted over with 28's worsted brown	=	1 end
		Repeat of pattern:	80 ends

Filling :—43 picks per inch, arranged thus:

1 pick,	2/56's worsted, red-brown (double)	=	1 pick
1 pick,	24's black, and 52's white, worsted		
1 pick,	2/40's worsted, black	×16=	32 picks
1 pick,	2/40's worsted, black		
2 picks,	24's black, and 52's white, worsted	× 6=	24 picks
1 pick,	2/40's worsted, black		
1 pick,	24's black, and 52's white, worsted		
1 pick,	2/40's worsted, black	×17=	34 picks
1 pick,	24's black, and 52's white, worsted	=	1 pick
		Repeat of pattern:	92 picks

Finish :—Worsted finish, 56 inches wide.

THE SIZING OF COTTON YARNS.

II.

ANTISEPTICS.

These are a class of bodies which are introduced into the size in order that the growth of mildew may be prevented. Their function is a destructive one, and wherever the spores are allowed to germinate, a tender yarn is the result.

The article most frequently used is chlo-

ride of zinc, or muriate of zinc, which fulfills two purposes, viz.: as an antiseptic for the prevention of mildew, and as a weighting body, hence its superiority over other substances used as antiseptics only. It is placed on the market in two forms, liquid and solid, and is prepared by dissolving zinc in muriatic acid, and as there is always some little free acid present this is neutralized by means of soda ash; the slight trace of iron that may be present is precipitated out, the liquor allowed to settle, then run off into vats to age. It is a pale yellow liquid, and the color should only show slightly by transmitted light. It should be perfectly free from iron and free acid. It is precipitated in the form of an oxychloride when water is added to it, and the white turbidity or milkiness is re-dissolved in excess of the chloride of zinc. It attacks iron with great rapidity, and should never be allowed to come in contact with that metal, as it at once begins to take it in solution. The liquid is often of 49 deg. B., or of a specific gravity 1.51, or a gallon weighs 15 1/10 lbs. At this strength it should contain from 44 to 45 per cent. of pure zinc chloride. It is liable to adulteration, the chief adulterant being common salt. The solid form is simply the liquid form evaporated down until the solution attains a temperature at which the percentage of the zinc chloride is a constant, when it is then packed in lead-lined casks and hermetically sealed. At the destination the stuff is dissolved in water and made to a convenient strength.

When purchasing or receiving consignments of zinc chloride, it should be examined, and its quality noted. A sample of it should be placed in a tall glass jar, so that the color, etc., may be noticed and in this form it may also be tested for strength. Testing instruments are not in every case absolutely correct, for which reason it is advisable to compare them with a standard instrument, and the fault, if any, noted. For reading, place the eye on a level with the surface of the liquid, in turn reading the indication upon the hydrometer, that corresponds with the surface of the liquid. Then by using a thermometer bring the liquid to 60 deg. F., either by cooling the jar with cold water, or stirring in a warm place, if below that temperature. Increasing the temperature will expand the liquor, i. e., make it thinner, consequently lower the registering of the hydrometer. The test for presence of free hydrochloric acid should always be made. The litmus test is of no use on account of the acid reaction of zinc chloride toward litmus. Methol orange, when added to the liquor, gives no sign of its neutrality, being strongly basic before any change will occur in the indicator. The best method is to add slowly a little of the liquor to water in a glass vessel, when a white flocculent precipitate will be formed. Care should be exercised in doing this, for if too much zinc chloride be added at once, no precipitate will form, it dissolving readily in excess of zinc. This test with careful manipulation will yield excellent results.

Probably the most objectionable impurity that muriate of zinc may contain is iron, possibly in the form of ferric chloride, which on account of oxidizing in the fibres of the cloth, in the presence of air and moisture produces dark colored stains, uniformly, throughout the material handled. The best method to test for iron, is to add to a small quantity of the liquor in a test tube a solution of powdered nutgalls dissolved in methylated spirits and when a blue precipitate will indicate iron, which becomes darker on standing, whereas a light brown precipitate is formed when no iron is present.

The presence of common salt can only be detected in a sample of the liquor, by a complete analysis, and preferably by an experienced chemist, who has had considerable experience in the examination of zinc chlorides, other tests not being reliable. It is, however, present in small quantities in all samples of commercial zinc chloride, and is not considered an intentional adulterant, provided not exceeding of 2 to 3 per cent.

Ammonium chloride may be found by adding a strong solution of caustic soda to a sample of the liquid in a test tube, and boiling well. Ammonia will then be formed, and which can be readily detected by its characteristic smell.

Other antiseptics besides zinc chloride have from time to time been proposed, but the properties as mentioned before, odor,

color, poisonous nature, cost, etc., have not allowed their use as a commercial article.

Carbolic acid, i. e., phenol, is in its crude state a dark brown oily substance, having a peculiar and not unpleasant odor. It is prepared in the distillation of coal tar, the purified product being a clear, colorless liquid. In its concentrated state it is strongly caustic and poisonous, and in the form of crystals it is not readily dissolved in water. Being a powerful antiseptic, it not only prevents fungoid growths, but killing any that may be already produced.

Salicylic acid is also a coal tar product, being a white crystalline body, the crystals being very small. It is also a powerful antiseptic, and its non-poisonous nature, when in small quantities, renders it fit for this purpose, but its cost prevents its use.

Arsenious acid is also a powerful antiseptic, but is of a highly poisonous nature.

Perchloride of mercury is no doubt the most powerful antiseptic known, and with the exception of the cyanides, the most powerful mineral poison. This, together with its high price, prevents a wider use of it. Although many other bodies besides those quoted have been proposed, none have met with success.

A blue dye is sometimes used in very small proportions for the purpose of tinting, i. e., correcting a tendency to yellowness in the size mixing, and when said blue dye changes it to a bluish white.

With reference to quoting recipes for mixing size we omit this point for the fact that all recipes depend upon a certain grade or quality of the substances used, structure and conditions of yarns under operation, cloth woven and its finish required, make of machinery for doing the work, etc., all being items which vary in different mills. The best plan is to consider the construction of the yarn and results required, and then carefully make up a trial mixing, changing the same if so required until the proper combination of substances for a certain class of fabrics is obtained and to which afterwards we then adhere.

With reference to boiling the size the best plan is to boil until the size is thoroughly heated and partially cooked, the pressure of steam used, and particular make of a size kettle at disposal largely determining the amount of time required. Except in such cases where a strong mixing has to be boiled, it is not necessary to boil the mixing any longer after the latter begins to bubble; however, the size must be kept boiling when in the size box of the slasher. A well boiled size will save in amount of materials required for treating a certain amount of yarn, besides resulting in better work in the weave room, than if this point was slighted.

Having given a fair description of the various articles as used or can be used in the preparation of size mixing we will now consider more in detail the machinery required for applying this size to the warp, viz.:

The cylinder slasher.

The main parts of this machine are:

1st. The creel section.
2d. The size box.
3d. The drying cylinder.
4th. The headstock.

The most approved construction of a slasher is such as will carry the yarn through the machine with as little tension or strain as possible, also that the drying must be done with as low a temperature as possible consistent with quantity as well as quality, since over drying or drying at an excessive temperature will impair the elasticity and strength of the yarn under operation. The usual place where the elasticity of the warp is seriously damaged is between the squeezing rollers of the slashing frame and the drying cylinder or cylinders. The sized yarn, before it is dried is also liable to be ratched in connection with some of the old-fashioned makes of slashers, or through negligence of the operator; however, with good machinery, a careful slasher tender, and the proper sizing ingredients used no trouble should occur.

The creel section in the usual construction of the machine provides bearings in its side frames for holding eight beams, arranged in two rows of four beams each.

The size box in the modern machine is fitted with two strong seamless copper rollers, whereas in other machinery one of copper and one of wood was used. In connection with some machines a separate size boiling compartment is provided, with a self feeding apparatus for the size, the rollers

working outside the box in broad brass bearings. The steam pipes for boiling instead of proceeding from a single pipe at one end and branching into two forks, are separate, receiving steam, one from the right, the other from the left, in order to insure an equal boil over the whole width of the material, whereas if boiled from one side only, the size will naturally boil more on one side than on the other.

The drying section in the standard slasher consists in two large cylinders, the one being 7 feet in diameter, the other 5 feet. They are strongly, and at the same time lightly constructed, the heads being made of steel properly braced, while the joint between the copper shell and head are so made, that by having the edge of the copper turned and held between the head on the outside and a ring on the inside, with through bolts, that it is quite impossible to blow it out, even under excessive pressures.

These cylinders are as a rule 60 inches face, steam being admitted to them through their hollow shaft, the same passing first through a reducing valve which is adjustable so that boiler pressure may be reduced, from 5 to 15 pounds or entirely cut off, the reducing valve being connected to the belt shifter so that when the machine is stopped by it, steam at the same time is shut off. The opposite side of the cylinder from the steam inlet serves as an outlet for the condensed steam. There are two methods in use to free the cylinders from water caused by the condensing of the steam on the inside of the cylinders.

The older system is known as the bucket arrangement, it being cups placed close to the inside shell across the entire width of the cylinder. These cups are so set that they lift the condensed water, as forming inside of the cylinder, and deliver it through a pipe out of the hollow shaft of the cylinder.

In the more modern system, this taking out of the condensed water from the cylinders in done by means of spiral scoops.

It is important to have cylinders put in the frames correctly when machine is first set up, so that they may run in the right direction for cups to lift the water. The makers commonly put arrows on the outside of cylinder to indicate the proper direction of revolution. The pipes leading condensed steam from the hollow shafts lead to steam traps which are for the purpose of allowing only the water to escape, and thus prevent waste of steam.

Cylinders have steam valves in the heads, which may be easily opened to allow steam to escape in case the machine has to be stopped. This cools the cylinders, and to some extent, prevents browning the yarn.

It is important to occasionally try the pet cocks in end of cylinders to see that trap is properly working and that the steam inside cylinders is dry. There is a gauge to indicate pressure of steam in cylinders, but it is possible for the gauge to indicate pressure while cylinders are cold, because of the presence in them of condensed water. Steam must be kept dry in order to properly dry the yarn.

The yarn travels from the size box, first onto the large cylinder, as situated in rear of the small cylinder, being at the same time located higher in the framing of the machine in order that the yarn in its passage to it will clear the smaller cylinder. After traveling around this large cylinder for about 4/5 of its circumference, it then leaves it and passes onto the smaller cylinder after just having passed their nearest place of contact, passing in turn around about 4/5 of the circumference of said smaller cylinder, and when in turn it is taken off by means of a guide roll, conveniently located in the framing of the machine, and in turn guided by means of two more guide rolls into the headstock of the machine.

The headstock of the slasher consists in the frame work for holding rods and reed required for separating the sized warp threads and the mechanism for winding the yarn on the loom beam as well as such for driving the machine. Previously to the warp entering the headstock, the same passes over suitable located fans placed there for cooling the sheet of warp yarn. The headstock also carries the measuring device, similar to such devices as used for other kind of warping, beaming, or winding machinery, the motion indicating the measurements by means of color imprints to the warp at regu-

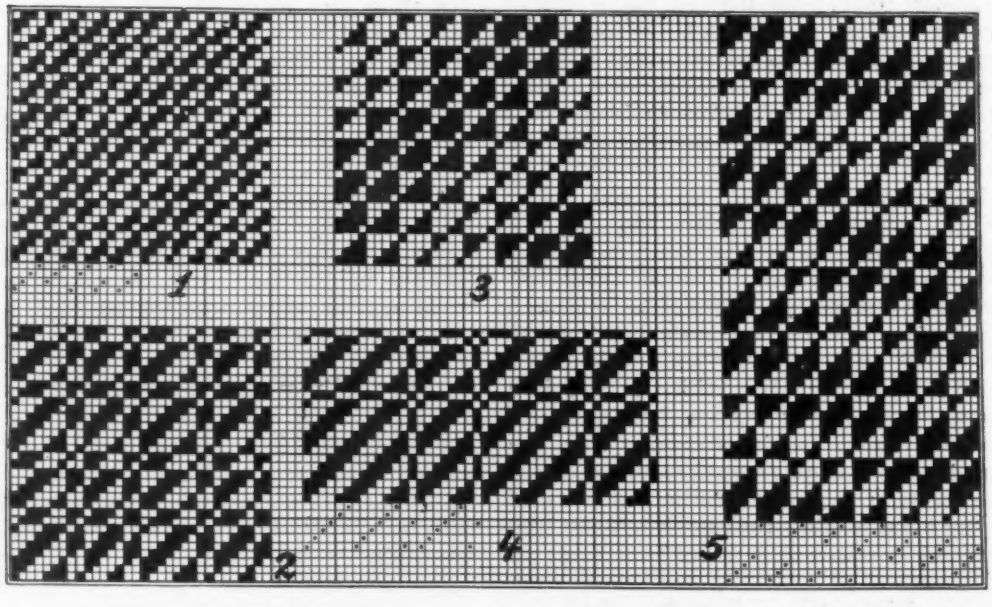
lar intervals, generally at the end of each cut so the weaver in turn will know where to end the cut of cloth weaving and to start a new cut. In connection with imprinting the cut mark, a gong is automatically sounded in order to keep the slasher tender posted no matter where he is engaged at the machine at that time. The mark is made by a revolving hammer, coming in contact with the warp for a short duration only, in order to produce a mark about 2 inches wide or less, and not a big smear as would be the case provided the hammer remained for too long a time in contact with the warp, for the fact that the warp is traveling through the machine at the rate of about 45 yards p. m. With reference to the reed as used in connection with the slasher, the same is also known as the expanding comb, from the fact that it can be readily adjusted (expanded or contracted) with reference to its width to suit different textures of warps under operation. Said reed is constructed in an open frame work leaving the springs and working parts exposed so that they can be examined and kept clean without difficulty. Dirt and flyings would otherwise accumulate and clog the springs, and thus prevent their contracting easily or even; a comb expanded irregularly is sure to cause trouble, because same will not make a smooth, even beam, which makes bad work in the weaving, and imperfections in the finished goods. With the open iron frame type of construction previously referred to, the threads as coming from the creel, pass over this iron framework of the reed and in turn obviates the necessity of using brass or glass rods to protect the box. Several improvements have been made in the method of adjusting the comb when operated by a tape. A ratchet wheel and pawl attachment obviates all danger of the spring being suddenly released, jerking the reed in, while winding up the tape, thus preventing the comb from contracting suddenly and breaking out the ends. When expanding the comb, the operator simply turns the hand wheel, the pawl being held in place by a spring, prevents any possibility of a reversal of motion. When contracting the comb, the operator simply takes hold of the hand wheel and as the pawl is raised, allows the reed to contract to the desired position. One of the important improvements in this comb is the method of attaching the tape to the springs, the same running straight from the roller to the springs, it being an attachment which will prevent breaking of the springs. The guide wire is placed between the two springs and in contact with the upper spring of the comb, which arrangement will keep the upper spring from dropping down, in turn producing a stiff reed.

When the slasher is running a light sheet of warp yarn, the same can be run at a faster speed than when required to size a heavy body of warp yarn, the amount of size to be put on the warp to be taken into consideration at the same time. Again in connection with fine work the machine must be run at a less speed than if dealing with coarse work on account of having to handle the fine work more particular.

On account of the steam arising from the size box and the drying cylinders, these two compartments of the machine are generally covered with a wooden, or what is better, metal hood, which carries away the steam arising from the yarn drying on the hot cylinders. Whenever possible this hood should lead through the roof. If slasher is not in a room next to roof a large wooden flue from hood may be run out the side of building and turned up a few feet. The flue leading from slasher should incline toward the outside of building, so the condensed steam will run out of the building. Sometimes, when a number of slashers are run in the same room, an exhaust fan is attached to the hoods, to draw out the steam. This is a good arrangement in any event.

The description just given covers the usual type of slasher, but there are other types which are in use. For instance, a single cylinder slasher is used instead of a double cylinder machine in those mills where it is important to economize space, and where a large production is not required. A single cylinder slasher would not produce as much work as a double cylinder slasher, on account of having a less drying area, which necessitates running the warp through the machine more slowly in order to satisfactorily dry it.

Some manufacturers use brushes to lay the fibres and as they claim thus improve the feel and appearance of the sized warp, especially in mills using very fine yarns, or on colored work, where a distinct weave effect is required in the fabric. These brushes are applied to the damp warp immediately after leaving the size roll in the size box. The brushes are circular, covered with a good grade of long bristles and by rotating at a suitable speed they effect the object just described. The yarn after leaving these brushes then passes to the cylinder in the ordinary way. Below these brushes is another brush which runs in a trough filled with water, and which by contact with the upper brushes keeps the latter clean.



OUR TEXTILE SCHOOL.

XIII. SKIP TWILLS, SKIPPING WARP AND FILLING WAYS.

This subdivision of our twill weaves produces the interlacing for some of our most modern effects in worsted suitings, being at the same time also extensively used for cotton as well as worsted and silk dress goods. As will be shown by means of the accompanying illustrations, large effects in connection with few harness can be produced. The principle of designing these weaves will be readily grasped from specimens of these weaves, although for the beginning the student will find more or less hard work; but if following directions given, after a little practice he will soon master the subject.

The first to do will be for him to lay out on the point paper (both warp and filling ways) in pencil outlines a diagram where the skip effect has to occur; in other words, lay out somewhat of a network in pencil lines to guide you where to stop your drafting the weave straight.

Next insert so much of one repeat or so many repeats of one repeat of your foundation twill as you possibly can introduce in your first square as outlined in pencil. Always try and start this with the largest number of drafting, both warp and filling ways first, since this will give you a better start, since smaller amounts of squares of the point paper, calling in turn only for a portion of one repeat of the weave, are apt to bewilder you at first.

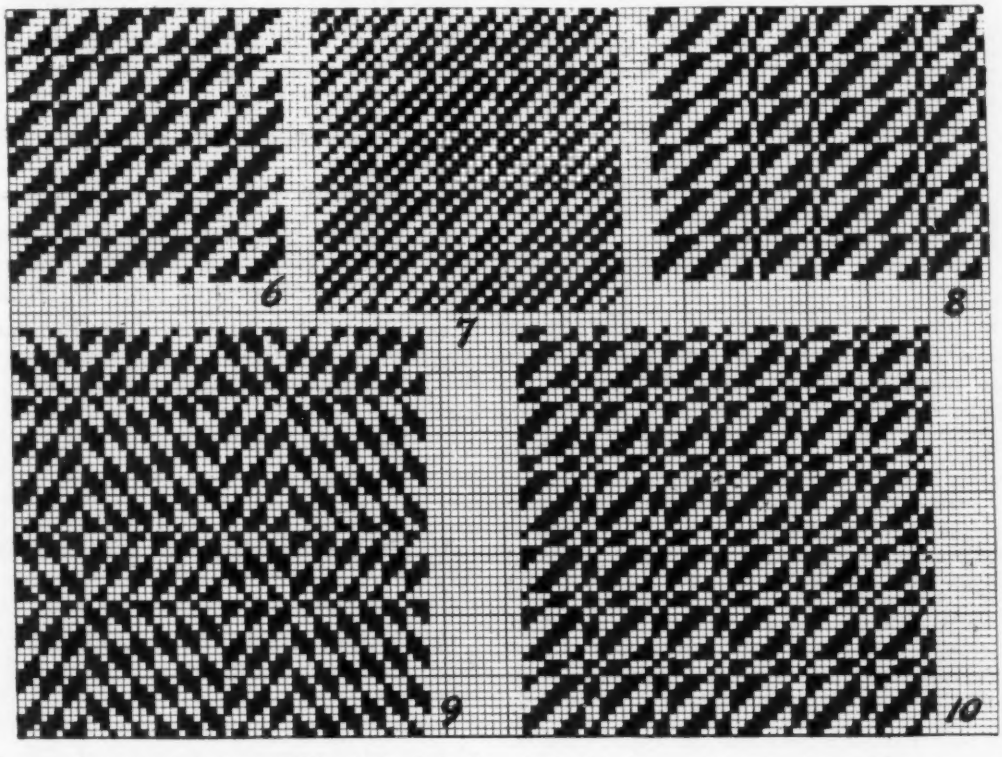
After thus having the first square of point paper as outlined in pencil, filled, proceed in the same manner, both warp and filling ways, as done with skip twills, skipping warp ways only.

In some instances small spaces like for example 2 × 2, 3 × 3, 2 × 6, 6 × 2, etc., may trouble you as to how to fill them properly with such portion of the foundation weave as will permit to obtain the repeat of the new weave, and in which instance by filling in first the larger surfaces, wherever possible, you readily will ascertain the proper portion of the foundation twill required for the smaller spaces at your disposal.

Weave Fig. 1 has for its foundation the $^{2}—_{2}$ 4 harness regular twill, drafted both warp and filling ways: take 4 warp threads and skip. Repeat of new weave 16 × 16 and which weave by means of its foundation draft, given below it in [.] type, for its drawing in draft can be woven with 4 harness, if the case should be necessary.

Weave Fig. 2 has for its foundation the $^{3}—_{3}$ 6 harness twill, drafted both warp and filling ways: take 7 ends and skip, take 2 ends and skip and continue in this manner until repeat of weave obtained both ways. It will be well to notice by the student that in starting the weave in the first square as laid out for it 7 × 7 we thus call for one additional warp thread and one additional pick over one repeat of the foundation twill. The repeat of the weave is 16 × 16 but which, if required, can be woven on 6 harness, i. e., the number of harness of the foundation twill.

Weave Fig. 3 (it may appear queer at a first glance to the student) has for its foundation the $^{4}—_{4}$ 8 harness regular twill,



drafted take 4 ends and skip until repeat of weave obtained, and which is 32 × 32; calling for 8 harness fancy draw for the lowest number of harness to weave it by drawing in thus: 1, 2, 3, 4, 8, 1, 2, 3, 7, 8, 1, 2, 6, 7, 8, 1, 5, 6, 7, 8, 4, 5, 6, 7, 3, 4, 5, 6, 2, 3, 4, 5.

Weave Fig. 4 has for its foundation the $^{3}—_{3}$ 6 harness twill drafted warp and filling way thus: take 13 and skip, take 1 and skip, take 7 and skip, take 1 and skip. Repeat of weave 22 × 22. Lowest number of harness required for its execution is seven as shown by means of foundation draft below weave in

[.] type if such is used for drawing in draft.

Weave Fig. 5 is obtained by means of a different drafting filling ways than that used warp ways. Foundation twill: $^{4}\!-\!_{4}$ 8 harness twill. Drafting warp ways: Take 4 ends and skip until repeat obtained. Drafting filling ways: Take 8 ends and skip until repeat obtained. Repeat of weave: 32 × 64. Lowest number of harness required for using on loom: 8 harness. For drawing in draft: see foundation draft given below weave in [.] type.

Weave Fig. 6 has for its foundation the $^{3}\!-\!_{3}$ 6 harness twill, drafted warp and filling ways. Take 6 ends and skip until repeat 18 × 18 is obtained; and which weave if so required can be woven on 6 harness fancy draw.

Weave Fig. 7 shows a specimen of a skip twill in which again only a portion of the foundation twill is used.

Foundation twill: $^{2}_{1}{}^{2}_{2}{}^{1}_{3}$ 10 harness twill. Drafting warp and filling ways: take 8 ends and skip. Repeat of weave, 40 × 40; lowest number of harness required for producing weave on loom, 10; drawing in draft necessary for this: *1*, 2, 3, 4, 5, 6, 7, 8, *3*, 4, 5, 6, 7, 8, 9, 10, *5*, 6, 7, 8, 9, 10, 1, 2, *7*, 8, 9, 10, 1, 2, 3, 4, *9*, 10, 1, 2, 3, 4, 5, 6.

Weave Fig. 8 shows a neat stripe effect produced thus; foundation weave, $^{2}_{3}$ 6 harness twill; drafting warp ways, take 13 ends, skip and take 1, skip and take 7, skip and take 1, skip and repeat; drafting filling ways, take 6 and skip; repeat of weave, 22 × 18; lowest number harness necessary for producing this weave on loom, 6; draft necessary for this, 1, 2, 3, 4, 5, 6, 1, 2, 3, 4, 5, 6, 1, 4, 1, 2, 3, 4, 5, 6, 1, 4.

Weave Fig. 9 shows a specimen of a skip twill broken warp and filling ways, with direction of the twill reversed at the same time; the construction of which weaves will require some study on the part of the student. The weave in question is produced thus:

Foundation weave used: $^{2}_{3}$ 6 harness twill.
Drafting warp and filling ways:
Take 3 ends twill left to right and skip ×3 = 9 ends
Take 3 ends twill right to left and skip ×6 = 18 ends
} ×2 = 54
Repeat of weave: 54 warp threads × 54 picks.

Lowest number of harness required: 6, and the

Drawing in draft for this: 1, 2, 3, 6, 1, 2, 5, 6, 1, 4, 3, 2, 5, 4, 3, 6, 5, 4, 1, 6, 5, 2, 1, 6, 3, 2, 1, 4, 5, 6, 3, 4, 5, 2, 3, 4, 1, 6, 5, 2, 1, 6, 3, 2, 1, 4, 3, 2, 5, 4, 3, 6, 5 and 4,

Weave Fig. 10 shows another very neat arrangement of the $^{2}_{3}$ 6 harness twill, repeating on 54 × 54.

The drafting of this weave is thus: Take 8 ends warp and filling ways and skip, take 2 ends warp and filling ways and skip, and continue to alternately draft 8 and 2 ends until repeat 54 × 54 is obtained. Six harness is again the lowest number of harness required for producing this weave if so required.

LESSON.

(1) Weave: $^{2}_{1}{}^{2}_{2}{}^{1}_{3}$ 10 harness regular twill, draft thus:

Warp ways take 8 ends and skip
Filling " " 10 " " "
} and keep this drafting up until repeat 40×50 is obtained.

(2) Weave: $^{2}_{3}{}^{1}_{1}$ 8 harness regular twill, draft thus:

Warp ways take 4 ends and skip
Filling " " 8 " " "
} until repeat 32×64 is obtained.

(3) Weave: $^{2}_{3}$ 6 harness twill drafted thus:

Warp ways take 3 ends and skip
Filling " " 6 " " "
} until repeat obtained.

(4) Weave: $^{2}_{3}$ 6 harness twill drafted warp and filling thus:

Take 8 ends and skip
" 2 " " "
" 7 " " "
" 2 " " "
" 6 " " "
" 2 " " "
} Repeat of weave 54×54

(5) Make out drawing in drafts and harness chain for all four examples given.

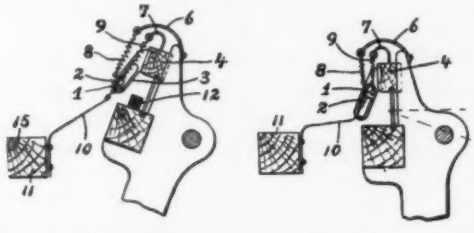
A GERMAN SHUTTLE GUARD FOR LOOMS.

Although these contrivances, no doubt on account of the superior mechanical skill of our fixers, are of little consequence to us, this however is not the case abroad, and where improvements in shuttle guards are continually brought forth, the present contrivance being a German invention just patented here, and which is given more or less for curiosity's sake, showing a late idea from abroad, how to prevent shuttles from flying out, and possibly in turn hurting the weaver, or better, to quote the inventor, "doing serious damage and endangering the life."

In order to explain the construction and operation of this "life saving device," the accompanying two illustrations are given, showing said shuttle guard in its two working positions, and which illustrations in connection with quoting numerals of reference will explain themselves.

In connection with the new device we find the guard rail, 1, made in the form of a movable rail extending along the shuttle race, and working in slotted guide straps, 2 and 3, fixed to the lay cap, 4.

This guard rail is provided with metal strips to work in the guide straps, so as to obviate rapid wear of these parts. To the top of the lay are fixed on each side curved



arms, 6 and 7, with hooks at their free ends for the attachment of helical springs, 8 and 9 respectively, in either instance. The other end of said springs are secured to eyes fixed to the guard rail, 1, and serve to draw the latter against the lay cap. To the lower edge of the rail, 1, at each end thereof, are attached retaining straps, 10, fixed to the breast beam, 11. It will thus be readily seen that at the retreat of the batten the breast beam straps, 10, pull the rail, 1, toward the lower end of the guide straps, 2 and 3, so as to bring it into a position to retain the shuttle, 12.

HOW TO TEST THE VARIOUS FINISHES OF COTTON GOODS.

When required to ascertain how a fabric, of which a sample has been submitted, has been originally finished, examine its external or physical properties, since a practical eye can detect at once if the fabric in question has been only calendered, or if starched on the back only or through the structure, etc.

Examining the fabric against the light it will show whether it has been starched or not. A heavily weighted cloth will lose much of its stiffness by rubbing it between the fingers. If, in tearing the sample, a lot of dust flies off, this indicates a weighted finish, (the more dust the heavier the weighting), and by the aid of the microscope we then may be able to detect whether the starching has been done only superficially or whether it has penetrated into the body of the structure, also if the same contains weighting substances.

The next point of value is to ascertain the amount of moisture in the sample, and which is done by carefully weighing a sample of a known size on a pair of fine scales and after recording this weight then drying the sample in a stove for some time, until there can be no further loss of weight, and when the sample is weighed again, and this weight subtracted from the first weight, the difference then indicating the amount of moisture in sample before it was tested, and from which answer it then will be easy to ascertain by means of proportion the percentage of moisture.

For example:

First weighing to be 6 grains.
Second weighing to be 5½ grains.

Loss: ½ grain.

and

6 : 5½ :: 100 : x

(5½ × 100) ÷ 6 = 91⅔ and 100 — 91⅔ = 8⅓%, amount of moisture in sample. Although this test and calculation will not show us the kind of finish, yet it is better to make it, since cellulose by itself is less hygrometric than starches, thus if there is a great percentage of moisture present it is a sure sign of the cloth being heavily starched. To ascertain exactly how much foreign matter a fabric contains, treat as large a sample of the fabric under discussion, as can be conveniently handled, after first weighing it with distilled water, containing malt; let it disaggregate, then wash, dry and weigh it. With this experiment the difference in the two weighings indicates the quantity of foreign substances deposited on the fabric; however, there may be certain insoluble soaps (softeners) still in the fabric, and for which reason the sample must then

be boiled in a weak acid solution in order to remove any fatty substances still adhering to the structure. After this boil, dry sample, weigh again and subtract this weight from the first weighing, the difference between both weighings being the amount of dry finishing matter in the sample and from which, by following calculation given before, it will be easy to ascertain the percentage. However we must also remember that when testing printed or dyed goods, that all colors are more or less attacked by acids.

The next procedure will be to ascertain the constituents used for starching, weighting or finishing and for which treat with boiling water for a few hours, which will remove the feculae, starches, thickenings, gums, soluble salts, alum, sulphates, chlorides, etc., as well as all mineral or earthy matters, after which, by means of filtering, separate the soluble from the insoluble substances. In order to ascertain the nature of those soluble substances, evaporate part of the liquid, treat a few drops with tincture of iodine, which will reveal starchy substances by turning blue. If no starch is present, concentrate the whole solution adding two or three times its volume of alcohol and when glue, dextrine and gum are precipitated. A tannin solution in turn will reveal the presence of the gelatin by precipitating the same.

In order to distinguish gum from dextrine use the polariscope, and when dextrine is diverted to the right, gum to the left. The mixture of the two can be sufficiently indicated by basic acetate of lead, which when cold will precipitate gum but not dextrine, whereas when warm, both.

If no precipitation is obtained, but an organic substance still shown by the incination on the platinum blade, then this indicates the presence of mosses, lichens, etc. Sugar is found by Fehling's liquor, before and after intervention; add to the tolerably concentrated aqueous liquor, a few cubic centimetres of pure hydrochloric acid, ordinary concentration, warm in water bath in an apparatus with reflux refrigerator and treat with copper solution. If desired to more closely examine the soluble mineral substances, employ the usual methods of analytical chemistry.

China clay or any other matter as was used for weighting purposes in the sample will be found in the residue insoluble in water, alabaster, gypsum and talc or French chalk, provided such should have been used, in the weighting compound, being also found in this residue.

Resin is detected by boiling the sample of cloth with carbonate of soda, which will dissolve it, its presence then being shown by the precipitate of sylvic acid as is obtained from the liquor when treated by an acid. Other fatty substances do not give any precipitate, but an oily fluid which swims on the surface of the liquor.

Glycerine, if present will also be found in the watery solution and is detected, after evaporation by treating with sulphate of potash.

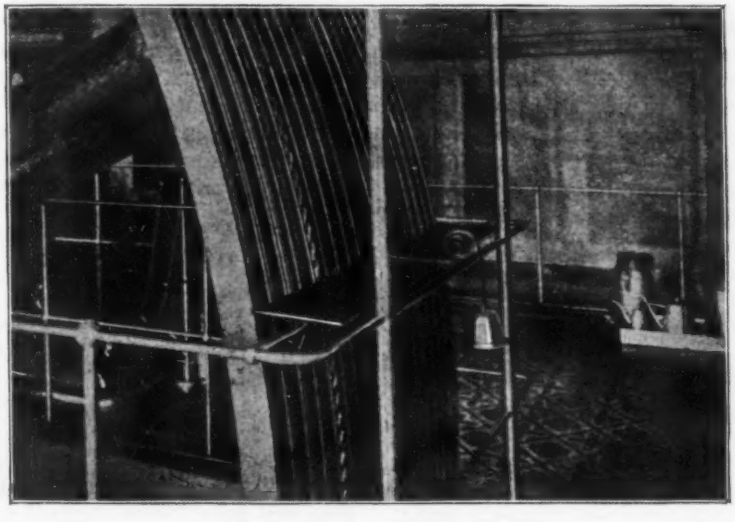
To ascertain the quantity of fatty matters used in finishing compound dissolve the latter by means of ether, and when after evaporation the weight of the residue expresses the quantity of fatty matter. By treating this residue with boiling water we then can ascertain if any soluble substances are in the water.

It certainly will be next to impossible to ascertain the exact proportions of the various substances as have been used in finishing a certain fabric submitted for analysis, however having obtained the nature of the substances used, and obtained a fair idea of about the proportions of each used, it then will be an easy matter for the practical finisher to judge on what substances to use on his part and the proper proportions of each, in order to duplicate said finish.

In an English shipyard, two hundred years ago, Peter the Great hired half a dozen ship carpenters to go back to Russia with him to teach their trade to his people. One result of that apparently trifling incident is that today the English inch is the basis of all linear measurement throughout the Russian Empire. A Russian duim is of the same length as the English inch; the archin is 28 inches; the sagen is 84 inches or 7 feet; a verst is 3500 feet.

ALARM FOR ROPE DRIVES.

In 1888 a large cotton mill was built in Gorkau, Bohemia, the engine being located on one side and at about the middle of the building. The power was transmitted to the different rooms by ropes from the engine fly wheel, half of the rope running to one side and half to the other. This arrangement was adopted in order to reduce the friction on the main bearing and also to avoid counter shafts. As it was feared if one of the ropes broke it would become tangled with the others and cause serious damage, the alarm device shown in the accompanying illustration was invented and applied to both sides of the driving wheel by Conrad Kuehne, one of the mill owners.



AN ALARM FOR ROPE DRIVES.

It consists of an easily vibrating plate to which a bell is attached by a spiral spring. The plate is so balanced that a slight excess of weight is on the bell side. If a strand of any of the ropes becomes broken it strikes against the plate and rings the bell. This simple device worked so well that the firm applied it on all the rope drives of their other mills. It has been found to work very successfully, not only on fly wheels, but on rope drives that are inclosed in isolated passage ways where the wear on the rope is likely to be overlooked.—(Translated by the Textile World Record from Bruenner Monatschrift fuer Textil-Industrie.)

In a paper read at a meeting of a society of dyers in Manchester, titanic acid (the oxide of titanium) was claimed to possess remarkable fireproofing properties, and evidence was produced in the shape of experiments by the reader of the paper. He took, for instance, some pieces of flannelette which had been treated with titanic acid, and put a lighted match to them. The incipient fire in the material smoldered and went out, refusing to burst into a flame. The experimenter claimed that all inflammable textiles could thus be rendered fireproof, and that dyeing, boiling, or washing would not remove the acid, it becoming, in fact, an integral part of the fabric.—From a report of Consul Frank W. Mahin, Nottingham, Eng.

Of the two grades of raw silk, organzine, made from the best selected cocoons, is used chiefly for warps, and tram silk, made from the poorer quality, is used for filling.

There are seven principal commercial varieties of cotton, the first three being, in the order of their importance, sea island, Indian, and upland.

CORRESPONDENCE AND NOTES

Upon Textile Topics at Home and Abroad.

LONG AND SHORT BOBBINS.

In order to secure further information regarding the use of long filling bobbins we addressed the following questions to a number of cotton superintendents and weaving overseers:

1. What advantages or disadvantages, if any, would result to the weaver or manufacturer from the use of an 8 1/2-inch bobbin instead of a 7-inch bobbin?

2. Would the use of the longer bobbin warrant any reduction in the price list for weaving and how much?

The answers which follow are of especial interest because they give the opinions of men who have a practical knowledge of weaving, and who occupy what may be called an intermediate position between the employer and the weaver. It is the duty of mill superintendents and overseers of weaving to see that both the weavers under them and the mill owners over them get fair play. The overseer or superintendent is the constant arbiter between employer and employe, and is often called upon to decide questions of far greater difficulty than that involved in a lengthening of the filling bobbin. In the replies the 7-inch bobbin is for convenience called No. 7; the 8 1/2-inch bobbin, No. 8 1/2:

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1. The advantage of bobbin No. 8 1/2 over No. 7: It lessens the spinning cost as it requires less doffing. It lessens the weaving cost as it requires less changing of shuttles when perfectly formed on a perfect bobbin, otherwise there are many disadvantages and one of the greatest is the breaking of the filling. It seems to me that the No. 8 1/2 bobbin has exceeded the limit for good results on 36 yarn. All other things considered, I do not think there would be much advantage to either weaver or manufacturer in using an 8 1/2-inch bobbin over a 7-inch bobbin on 36 filling yarn for prints or converter's goods where the filling is usually soft.

The change from a No. 7 to a No. 8 1/2 bobbin would warrant a reduction in the price list only in such proportion as the general conditions have been improved. These conditions cannot be determined by an outsider, as they must be seen to be fully appreciated. With a good warp stop motion, automatic filling changer and a bobbin of medium length, the weaving cost can be reduced to something like 33 to 40 per cent. without reducing the weaver's pay.

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3. I have had some experience with short and long bobbins and made a catch of my own. A weaver can run the work better with the long bobbin, but they must look after the bobbins and take good care of them, and must not batter up the ends or cut them with a knife. If they do it will cause the bobbin to run bad on the filling frames and also cause the yarn or filling to break in the loom, so that in a short time they will have looms stopped as often as if they were using the short bobbins.

Long bobbins save doffing on frames and thus make a saving in the spinning room. How much they reduce the labor of weaving depends on the care taken with the long bobbins. Doubtless weavers can make more money with the long bobbin, and do it more easily than with the short one, but I cannot state positively what reduction of the price list would be warranted by the lengthening of the bobbin.

Warp stop motions are all right on some kinds of work. They surely will not cause less ends to break and probably will cause more, but they save pickouts and give better cloth. I do not think a weaver can run many more looms with the stop motion than without it. On good work manufacturers

will have to adopt the stop motion if they keep up to the standard of the mills that use them. I do not see where the manufacturer is going to get his money back for the cost of putting them on. He ought to get a little more for the cloth made with the stops. He saves something by having less seconds with the motion.

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7. The advantage in using bobbin No. 2 would be a saving of labor in replacing filling and in increased production per loom. The mill where I am employed put on stop motions last year and the weavers had to work hard to get within 2.1 per cent. of the old production, but by making the cops longer and larger, putting more twist in the filling and taking out the carriage draft on the mule, the filling ran so much better that the weavers do not work near so hard now and yet they get more yards per loom. I do not know the exact percentage of gain.

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9. This is a question that has been before mill men for years. They have been wondering where the limit was in getting more yards into a compact state in order to save handling, which means saving labor and cost. There is but one way to find this out and this is to make a thorough test, and with the present question the test means beginning at the spinning frame. Now if the yarn was made just as good on the 8 1/2-inch bobbin as on the 7-inch bobbin the weaver could run twelve looms about as easy as she could run eight the old way, but in this case it is not as good on the large bobbin as on the small one. I find that while the bobbin is but one and a half inches longer and has more than double the yards on it, it must have been made on a larger ring, therefore the yarn is not as good. In all my experience I have never seen as good No. 36 yarn made on a 2-inch ring as on a 1 1/2-inch ring with the same speed of spindle. Therefore more breakages at the loom.

The shuttle should be as much longer in proportion as the difference in the length of the bobbin. Even at that there will be more breakages caused by the yarn ballooning against the shuttle and dragging around the end of the long bobbin, than with the short bobbin. Neither are the warp stop motions all sunshine, but the advantages overcome the disadvantages, so it is certainly an improvement by making better work. And it is easier for a weaver to step up to a loom and tie in an end than to look around and see one running with one or more ends out, especially when it has been running quite a while and has to be scratched up so it will not show in the cloth, as is often the case without the stop motion.

Furthermore, in using the long bobbin it requires closer attention to the management of the machines. First, in the spinning room where the build of the bobbin must be just right. Second, in the weave room, where the shuttles must be kept in perfect condition and bobbins must be kept perfectly smooth. It is also necessary to prevent all other imperfections as much as possible, as they will show up on the long bobbin and cause the loom to stop, where they would not on the short bobbin. If these requirements are fulfilled a weaver can run ten looms as easily as eight of the old style, which means a 20 per cent. reduction of help on looms,—a very important factor in the cost of weaving.

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10. I cannot speak from experience on this question as I have not used any of the long bobbins, but I see no reason why they should not be a success if proper attention is given to the wind and taper in the spinning room. The filling breaks when weaving from No. 7 as well as from No. 8 1/2, causing pieces, waste and loss of time. I should think the long bobbin would warrant a reduction of from 12 to 15 per cent. in wages, as it runs so much longer than the short one.

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11. Both weaver and manufacturer are gainers by the use of bobbin No. 8 1/2 instead of bobbin No. 7. No. 8 1/2 runs twice as long without a stop, thus increasing the weaver's earnings, by reason of fewer stoppages of the loom, which means a larger production. The manufacturer is equally a gainer by reason of increased production, which means cheaper cost per pound, also by reducing his chances of making seconds from filling change imperfections, a serious fault in light pick goods. The No. 8 1/2 bobbin reduces the chance of these imperfections 50 per cent. and gives the manufacturer a better cloth.

I am hardly prepared to give an opinion as to wages, but it seems as if the manufacturer should get some benefit from the improvement. Bear in mind, however, that the long bobbin relieves the weaver only from changing the filling as often, but it does not relieve him in other parts of the work. I think the reduction of wages for benefits received by the weaver should be small.

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14. At first sight it seems as if No. 8 1/2 gave a long gain over No. 7, but the greater tendency of the yarn to break at the bottom of the bobbin would materially lessen the gain.

The long bobbin would warrant a certain reduction in the price list for weaving, but this could be determined only by a trial with bobbins on a few looms.

23, From my own experience the long bobbin offers no advantage to either side. More yarn is put on a long bobbin it is true, but when it gets about three-fourths empty the yarn generally breaks and the majority of the weavers will not put the piece in the loom again. I fail to see why a long bobbin should warrant a reduction in the price for weaving, even if all the yarn ran off. I have 780 looms under my charge all equipped with stop motions. A weaver runs from 10 to 12 looms and I know for a fact that they are working harder and getting less pay than the weavers who are running only eight looms in other mills on the same class of goods. For both quantity and quality I will back my looms against any other mill in New England.

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24. A loom fitted with the long bobbin and warp stop motion combined has, in my estimation, very little advantage over the old 7-inch bobbin in the ordinary loom. A loom fitted with the warp stop motion and the ordinary 7-inch bobbin is undoubtedly a step in the right direction. The most fatiguing part of a weaver's work and the greatest strain on her eyes, is the walking round and round six or eight looms, looking for broken ends. This is entirely done away with when her looms are working with the warp stop motion attached, and I consider a weaver would have less work with eight looms fitted with this motion than she would with six under the old conditions. Of course it is quite possible that four out of the eight looms would stop at the same time and perhaps for ends broken that would not be noticeable in the finished fabric. Still it saves that broken end from getting entangled and breaking out a few more, which does occur under the old conditions. It frequently happens that when a weaver is busy drawing-in a warp end in one of the looms a broken end is playing terrible havoc with the warp in another loom, besides making floats which she may have to unweave or be fined. I consider the inch or two of cloth lost through the loom stopping is gained again by only one end instead of half a dozen having to be pieced.

This warp stop motion saves money for both weaver and manufacturer. The weaver is not troubled by getting wrong draws, because the ends will not break out in bunches. Floats will be practically unknown and so the weaver will avoid the trouble and expense in unweaving, in particular patterns. The warp stop motion is not only a cloth perfecting device, but also a great labor saving device and I consider a reduction in prices in consideration of its introduction would be fair, as a weaver could tend more looms and provided the reduction was not too much, make more money. I have a case in mind where this is being done and four-loom weavers are minding six with less work and getting more money.

The use of the long bobbin is to my mind a mistake and I do not think it has come to stay. I am sure that four looms fitted with the long bobbin would need considerably more attention than four looms fitted with the old 7-inch bobbin. There would be more breakage in warp threads due to the increased thickness of shuttle as the new bobbin is thicker. We must have larger shuttles and larger sheds, and so strain the warp threads. The increased weight of bobbin and shuttle do not tend to lessen the breakage in the bottom part of the shed.

There would be more breakage in filling, due to the extra length of bobbin, as the yarn will not come over the nose of the bobbin as it should when the bobbins get about three-quarters finished. The last quarter would

cause more trouble for the weaver and cause more broken picks than would be the case if the weaver had only to change shuttles as she would with a 7-inch bobbin. Then again the cumbersome weight and length of the new shuttle is against quick shuttling. If a weaver must mind more looms she ought to be able to shuttle more rapidly.

These few items account for the disadvantage to the weaver, but there is a greater disadvantage to the manufacturer. The strain on heddles, lingoes, reed and extra power required in picking will make extra cost in mill stores, also worse cloth will be the result.

If the Fall River manufacturers had been satisfied, for the present, with adding the stop motion, it would have been more satisfactory to all. Adding the disadvantages of the long bobbin to the advantages of the warp stop motion makes it about equal to the old conditions. I do not see how a reduction can be made and be fair to all.

BLANKET MANUFACTURE.

BY JOHN W. PRIESTLY.

Woolen bed coverings were first manufactured by one Thos. Blanket, a native of Bristol, England, early in the thirteenth century, hence the origin of their distinctive name. The wools chiefly used in the manufacture of blankets are domestic, English, East India, Welsh, and the coarser grades of New Zealand and Australia. Besides these, noils and wastes of various kinds from worsted mills, cotton and ground rags of all colors and qualities, are used in considerable quantities. Ramie and jute are used occasionally. Cow hair forms an important part in the composition of gray blankets.

Generally speaking, the wools for blanket purposes are used unscoured, and the preliminary process to mixing is simply a dusting or shaking of the stock to clear out the lime, dust, or sand. In East India wools particularly, the amount of sand present is often very excessive and when buying this class of wool care should be taken accurately to estimate the prospective shrinkage from this cause.

After this partial cleansing, we will assume the various wools to be graded or sorted into the respective qualities ready for mixing. The qualities required for the batch are laid in layers alternately upon each other, until the whole blend in one pile. The operator who feeds the picker should take care to pull the wool straight downwards from top to bottom and so secure a fair mixture of each sort on the feed sheet of the picker.

The question of lubricating the stock comes next for consideration. Speaking from experience, however, I would say that he is a wise man who uses only a reliable oil, and not seldom it will be found that the most expensive oil will prove cheapest in the long run. It must be remembered that the oil has two purposes to serve: First, to lubricate for the fibres in the carding and spinning process, and second, to assist in the process of scouring the woven blankets, forming, with the addition of alkali, a natural soap.

Much might be said upon the subject of wool oils. The best oil is the one containing the maximum say ninety-eight per cent. of saponifiable matter, and the minimum of free acid. If free acid is present it deteriorates the spinning and fulling properties of the wool, and the finer the wool the more marked will be the damage. I remember a case in point which happened some two years ago. I was buying a wool lubricating oil under a guarantee that seventy-five per cent. was saponifiable. Having occasion to use up some fine stock, which had been laid by for some time, it was noticed that the blankets when woven were absolutely dead to fulling. They would not shrink an inch, although the first half of the batch had milled up with ease. Inspection led me to suspect the oil, and an analysis proved that it contained fourteen per cent. of free acid and but forty-eight per cent. of saponifiable matter—hence the damage. Moral: Use good oils and have them tested occasionally.

In case of blends containing cotton, it is advisable to oil the wool stock only, as cotton and grease do not work well together. If the blend is too low in quality to warrant the use of pure oil, the following mixture is a fairly satisfactory substitute, but the stock should be used up at once or it will become dried up by evaporation. Seven gallons

best lard oil, ten gallons condensed steam water, one pint of ammonia.

When picking a mixture of colors it is well to give an extra run through the picker to avoid any danger of shadiness. A word here with reference to rag picking. The coarser grades of rags are largely used for grey blankets woven with a fine cotton warp. The best results are obtained by running the cylinder slowly and the feed quickly. The length of staple is much better than when the cylinder has been run at a high speed. In the latter case, the rags are "ground" up and the shoddy comes up shorter and consequently wastes more on the card and does not spin as well. Where a rag picker is working steadily, the cylinder should be turned twice weekly to keep the teeth in good condition, i. e., smooth and evenly worn. The production with an 18-inch feed and 40-inch cylinder should be approximately 1200 lbs. of hard or 1500 lbs. of soft rags per day of eleven hours. A steam connection should be run into the picker bin with a valve outside. By this means a fire in the picker bin can be quickly smothered out.

An efficient card room overseer is the blanket manufacturers' best friend. A maximum of production; a minimum of wastage; a thorough mixing of the batch; careful manipulation to preserve the length of staple; freedom from slebs and neps, and a condensed thread that will draw and spin well. All this is called for, from the man in charge of the cardroom. In blankets especially, production in the card room is the one thing needful, and looms should be added if necessary to keep up with the maximum output. For blanket work the ideal card is a two part machine 66 inches wide on the wire. Automatic feed on breaker, garnett clothed licker-in, 40-inch breast, two 50-inch cylinders, 32-inch doffers, four sets of workers and shippers over each cylinder, and three over the breast, fly comb, for taking off the web.

For plain solid color work, a Scotch feed is best as an intermediate. Where a mixing of colors is required a balling head creel feed is to be preferred. Finisher: Two 50-inch cylinders, 32-inch doffers, double doffer condenser; 16-inch doffers, tandem rubbers with the regulating motion for speeding when necessary. For medium work, i. e., say 3/4 to 1 3/4 runs take off one thread for every inch in width, 64 good and 2 waste threads. The workers should be as large as practicable as the possible production of the machine is governed by the surface of the card clothing. The opinions are many and various as to the possible production of a woolen card. Working on blanket stock as above, however, it should run 600 lbs. per day of eleven hours.

It is frequently the case with a blanket card room that white and colored batches are in process at the same time. Subsequently it will be noticed that the white blankets are dotted here and there with grey or colored hairs. This is most frequently caused by "flyings" in the card room and may be avoided if care is exercised.

The waste from the cards is taken and dusted, and afterwards used up into an inferior quality. When carding cotton batches, keep the cards well cleaned, as accumulation of grease on the rollers will cause bad work. The grinding of the cards is very important. Generally speaking there is too much grinding. The rollers should be set so that they keep each other "in point" while working, and if this is done, the clothing is kept in better condition and its life is considerably lengthened.

Regarding the rubbers for condenser, there are many methods of cutting or stamping their surface in order to obtain a greater functional power. There is nothing that gives better results than the plain leather, however, provided it is well made and fitted, and its durability is twice that of the fancy rubbers.

The spinning of blanket yarns requires a careful discrimination. As the stock is intended for warp or filling, or as the blanket is to have a soft and lofty, or a firm finish, the yarn must be spun accordingly. White woolen warp, where strength is the first requisite requires a stiff draw and lots of twist. If it is likely to lie in stock for some time before weaving, it must be extra well twisted, as the twist will run out by keeping. Carded cotton warp, while needing a hard twist, requires an easy draw and must be condensed

more nearly to spun length. Filling for a soft, well napped blanket must be loose with little twist, and no more strength than will enable it to stand the strain in weaving. Where there is to be heavy fulling, the filling should be a fairly solid thread. With white Whitney blankets it is very essential to use a soft filling, as these blankets call for a heavy nap, even in the lowest qualities, and it is impossible to get the cover on a piece where the weft is twisted hard.

Winding: This process is dispensed with by the English and Scotch blanket makers. The looms are made to take large shuttles that will hold an eight inch bobbin. The bobbins for weaving are taken direct from the mule and fitted to a spindle in the shuttle. While this dispenses with the expense and loss through waste of winding, the looms having to take a so much larger shuttle cannot be run, at so high a speed, which, generally speaking, does not exceed seventy-five picks per minute. The question as to the relative advantages of the respective systems is worth discussion.

ENGLISH NOTES.

(By our Special Correspondent.)

The advance in merinos and fine cross-breds at the May sales in London had the immediate effect of stopping some business. So soon as the news was out people in the clothing trade determined to discourage the tendency by withholding business. More Japanese army orders have been placed, however. One large contract is with Starkey Bros., Ltd., of Huddersfield—and at prices higher than before. The moral effect of this windfall is perhaps greater than its actual one. The Japanese orders have become a standing apology for the statement that if one man will not buy wool at the price, another will. Shipping orders for goods are better than domestic ones. Even South Africa is said to be looking up and if Australia leaves something to be desired there are driblets coming in that make the manufacturing position better. Perhaps there is a valuable moral conveyed by the statement that now, as hitherto, specialties are going best, and advertised specialties, perhaps, best of any.

During the first week of June the Cotton Congress is to sit at Manchester primarily to discuss such matters as cotton-growing and employers' federation and, incidentally, the metric system. The Congress will therefore continue the discussion begun in Brussels at the sitting of the International Committee. Delegates from most European countries will be present and an attempt will be made to persuade Lancashire men that the metric system can do them good. At Brussels the apostles of the metric escaped collision with the cold weight of commonsense that they will not improbably encounter in Manchester. The demand for a change in the English system of noting cotton counts comes from abroad. The 840-yard hank is quite as good a basis as the Englishman needs for his own use and it is quite certain that the typical textile man has no more intention of abandoning his immemorial standard of measure than of dropping his mother tongue. There are agitators for and against the metric system, but the mass is unlikely to be affected by the rhetoricians of the Continent.

One of the early consequences of peace in Russia and Manchuria will be a demand for textile machinery, belting and mill furniture in Poland. Manufacturers in Lodz and Warsaw have bought very sparingly during the troubles. A correspondent suggests that with peace will come a need to extend some plants. Cotton yarn between 70s single and 180 2-fold for the lace trade will also be wanted. Coarser counts are prohibited by the duty of 25 cents per lb.

In England a general incredulity as to the genuineness of Canadian woolen manufacturers' woes is noted. A number of our woolen men know Canada and have inspected Canadian plants. Nothing flattering is said of the condition or capacity of some of these and it is argued, with instances quoted in point, that where skill is linked with good machinery woolen manufacture is really rather prosperous in the Dominion. The perfect right of Canada to impose such duties as she thinks fit is not denied. But woolen people say that the man who cannot succeed under circumstances existing in Canada could certainly not succeed on this side of the ocean. They agree generally in thinking that Can-

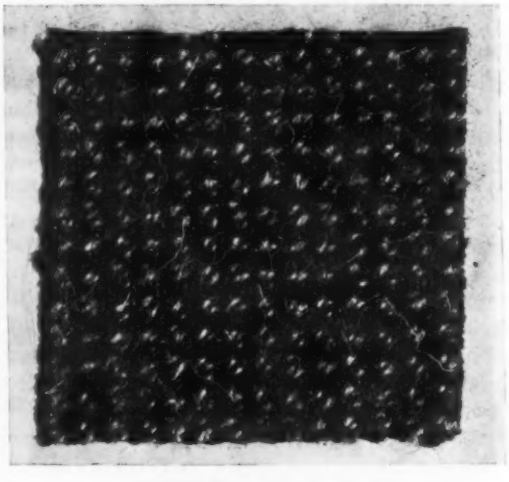
ada needs aptitude and learning rather than high protection in order to make money.

It is conceded that those who are not making money now in the cotton trade have every reason to quit that line of business. The margins earned were never larger in living memory and the Eastern orders are more than satisfying. One of the largest orders known has been confirmed from India. It is for 340,000 lumps in our line for delivery in January, February and March, 1906, and had delivery been possible earlier the quantity would have been doubled. As an instance of the profitable nature of business it may be said that one mill has the assured prospect of regaining this year all the deficits that have accrued in the three years previous with a margin of surplus. Also that five large spinning mills on stock taking find themselves with a total profit of 23 per cent. on the aggregate share capital, after deducting interest and depreciation charges.

Our China trade is so largely textile that the newest dictum of experts both in England and Germany may be appropriately quoted. It is now taken for certain that those only who know Chinese can hope to retain their hold on the market. The old mercantile system is visibly breaking up and is destined to give place to a new and more intimate relation between producer and consumer. The victory of Japan is held to supply the last and most cogent reason for acquiring the vernacular at once.

The five-dollar overcoat is exercising its tyranny over the woolen trade. In the export trade to the Colonies it is practically impossible to sell garments in bulk which cost more than three dollars odd. In these and ready made trousers at 37 cents the pair, a brisk trade is doing. Re-acting on the mills, these influences are making the use of wool substitutes imperative. They help to explain also the important extensions in manufacturing facilities that are being made by the Colne Valley group of mill-owners. The projected extensions to the Crowther-Bruce plant at Marsden near Huddersfield will make this mill, it is said, the largest self-contained woolen factory in the world.

On the Scottish borders some woolen people are turning to the attractive trade in ladies' costume cloths at about 50 cents in 44-inch, of which we show one pattern. These contain a heavy percentage of pulled wool with some kempy wools which produces a slight and casual zibeline effect on the face. Grandrelle twist yarns are used in both directions and the colorist indulges his license to produce pleasing blends out of incongruous color mixtures. The designs are oftenest lib-



eral interpretations of styles made for men's wear primarily, with the inevitable overcheck. The combination of soft waste with hard wool produces a slightly crisp handle. Those who may venture to experiment on the same lines are recommended to note the effect obtained from cold pressing in contrast with hot pressing. Something is to be said in favor of leaving the goods something less than bone-dry. A not excessive moisture rather improves fabrics of the border type.

Manchester is warmly in favor of establishing a standard of moisture to be permitted in cotton yarn. A regain of 8 1/2 per cent. is proposed, being a bone dry weight of 9 lbs., 4 oz. for the 10 lb. bundle. This has been the Continental standard for thirty years and is, somewhat informally, an English standard at present. Glasgow objects to the Manchester proposition. Of course Bradford is virtually wedded to the 12 1/2 per cent. regain upon wool and spun silk. And in the cotton trade the confusion of standards leads to a discrepancy of 8 oz. per bundle between

the highest and lowest weights of dry cotton in yarn.

Rag-pulling Yorkshire has been disturbed superficially by the piercing complaint of protectionists in Australia. It has been alleged that "filthy, fever-laden rubbish from the hospitals and slums of Europe" is made into garments and exported to our nice clean Colonies with the germs of disease undestroyed in the fabric. Possibly some such heated idea may be current among the shoddy-phobes of America. It would be a kindness to lead such to a dye-vat and to ask what bacteria could survive its sterilizing influence.

Arrangements are completed now for the establishment of the first electrically driven cotton mill in this country. It is to be the Acme Mill, Pendlebury, and its cost is to be $500,000 for a complete plant of 80,000 spindles.

The opinion seems to be general that the existing plant for spinning Egyptian stock is handsomely adequate. Nevertheless, capital for new mills is being sought in the Bolton district and may be obtained. Money for investment happens to be abundant, but additions to plant seem to pre-suppose an absence of spells of bad trade in the near future.

A FEW HINTS TO A FRIEND.

BY THOMAS BARR.

One day I decided to run up to a small town in Massachusetts to see my old friend, Charles Corbin, whom I had not visited for over two years. Charles was overseeing the dressing and weaving in a small mill there. He had been brought up in the weave room and his knowledge of the art of dressing was limited to knowing how it ought to be done rather than how to do it. I telegraphed him I was coming and found him at the station to meet me. After the customary greetings he said:

"Tom, come right down to the mill. The work is going very badly and I believe you can help me out."

By asking a few questions I found that he had lately hired a new second hand for the dressing department. Knowing the class of men on his slasher, some having been there a long time, I suspected they were trying to hinder the work rather than help the new second hand.

"Well, Charles, let's go into the weave room and see what I can do for you."

As we entered the room I noticed a fine dust rising from the looms and as I stepped over near one of them I put my hand under the warp and gathered up a handful of the lint and dust from the floor, finding much starch in the form of fine dust. I said:

"Charles, how much starch do you use in a hundred gallons of water?"

"They put in 100 lbs. or better and boil it three-quarters of an hour," he replied.

"If you will take out 25 lbs. of starch and boil it one hour and a half you will save this 25 lbs. that passes off here in the shape of dust."

"Well, Tom, just notice this warp. Here is a loom that is stopped half of the time. I have tried every plan that I could think of, but I can't keep the ends from breaking, and they seem to be the same ends that cause the whole trouble."

I stepped around and felt of the warp. The yarn was sized just right. I ran my hand over the warp and found that it had a number of soft spots in it. These were caused either by a bad reed or by the slasher man allowing a smaller number of ends to run in one dent than are laid in the rest. There is another time that ends are apt to snap and break. This is on the last few cuts on the beam, when the slasher man starts with too much friction. He should be taught to start the warp with a very little friction and increase it after running the first three cuts. Then he will make a warp that will run as well on the last cut as it does on the first. I find it a good plan for the slasher man to draw down fresh size on the last three cuts of the beam. This rule will keep the size regular in the size box and I find that if a weaver in starting her warp finds it O. K. she imagines it will run well throughout and vice versa.

I explained all this as we passed down the room.

"Here," remarked Charles, "is a new pattern that we cannot weave perfect. Every

cut has been a second and I don't know what to do."

Upon examining the cloth I saw it was made from a warp that had a twisted end in the pattern, and that it had been dressed with the cord passing through the size with the other yarn.

"Charles, never size a cord, whether it is a selvage or in the pattern. If you do you may expect to see kinky ends in your cloth."

Passing through the room I found there were warps that were soft sized and others that were hard sized in spots, where the slasher man had allowed his slasher to stand too long in one place. All these troubles came directly from the dressing room and as I mentioned these facts to my friend he said: "Come up stairs and tell me just how you manage a dressing room."

"Now, Charles, this is just how I do, week in and week out. Never change the rule if you want to be successful. The first thing in the morning step down to the size tanks and feel of the size, and in all probability you will find it too thin, or as we say, too light. Have your size man take some starch mixed in a pail with water and add to the size in the kettle and have it boiled hard for ten minutes and test again. Do not let the slashers start if the size is not O. K., otherwise your warps will be light sized. About one hour later come around and feel the yarn on each slasher. This you should do two or three times a day. You must, of course, require your second hand to be ever on the alert for the sizing and other details, but always bear in mind that the size is the most important feature in this department.

"Now in regards to your slasher men. They should be instructed regarding the results of bad work going to the weave room. Let them understand that it must be quality first and quantity next. Be sure that you have a ticket on ever warp before it leaves the slasher. This should have the date, style, pattern, ends, yarn count, the slasher man's name and a blank space for the web drawer's name. Then in case the warp is returned you have all the information needful to find who is to blame. I wish I could impress upon the minds of superintendents that even if their mill is small, they will be saving money by employing a practical man as overseer of this department. Great damage can be caused by little things which none but those who have been over the ground would notice. Again, there is the waste of tallow and sizing besides the starch. A pound here and there soon makes a total that will astonish many a superintendent."

Charles thanked me for my suggestions and then we left the mill and its troubles to enjoy the social side of my visit.

LINEN FIRE HOSE.

In the article on "Linen Fire Hose," in the May issue, Fig. 4, showing a linen lined hose should have included both rubber and linen lined hose. The corrugations of the rubber lined hose although large are comparatively smooth and thus do not retard the passage of the water as do the rough corrugations of the linen lined hose.

A PLAN TO INCREASE THE USE OF COTTON.

Editor Textile World Record:

It is said that the Southern cotton planters are considering a scheme by which to raise the price of cotton by increasing consumption. The method to be pursued, as I understand it, is to try to induce the fertilizer concerns to use cotton in lieu of jute bags, and to substitute cotton bagging for jute bagging as a material for baling the cotton crop. In view of the marked difference in price betwen the two fibres, I do not think the proposition can be taken seriously. It should also be recalled that the experiment of using low grade cotton in the manufacture of baling cloth for the cotton crop, was tried about 1890, when the price of jute baling was increased from 7 to 12 cents per yard. Some bagging was manufactured, I think, by a New Orleans concern, but even with the high prices that prevailed for bagging at that time, and with the price of the raw material much lower than at present, the enterprise was a failure.

The standard commercial fibres have their fixed places in manufacture, and it is a pretty difficult matter to bring about innovations.

Even were the two fibres, jute and low grade cotton, to be obtained at the same figure, it is doubtful if such a change as that contemplated could be made, as it would involve a modification, if not an entire change, of the machinery employed in bagging manufacture.

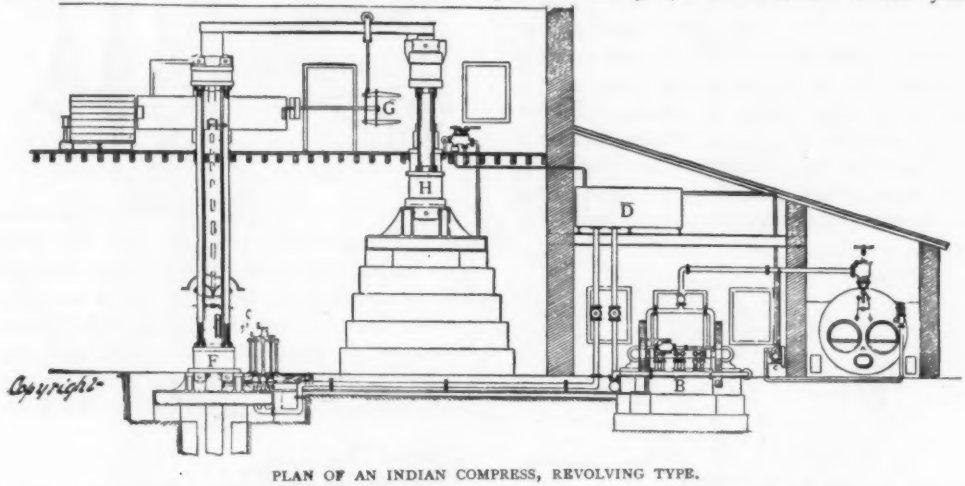
CHAS. RICHARDS DODGE.

Washington, D. C., May 20, 1905.

BALING COTTON.

Editor Textile World Record:

In your March issue I noticed an article on Indian cotton bales from particulars given by the American consul at Marseilles. As I have been intimately connected with the pressing industry for the last thirty-two years, of which I spent twenty-four years in India erecting and working factories, I may perhaps be permitted to claim some experience and knowledge of the subject.



PLAN OF AN INDIAN COMPRESS, REVOLVING TYPE.

I enclose an illustration of the revolving type open Indian factory for making 400-pound bales of cotton, measuring 9 1/2 cubic feet when out of the press. The operation is very simple, as follows: The cotton is weighed on the scale, E, and then passed to the press, F, which compresses the material sufficiently to enable its removal by the cage, G, to the finishing press, H, where the cotton is still further compressed and the bale lashed with steel hoops. The presses are driven by the hydraulic pumping engine marked B.

I have supplied a large number of factories with this class of press, which is capable of making 32 bales of 400 pounds weight per hour, but when I have supplied a second press, F, or say, two F presses working in conjunction with one H press, the production has been 40 to 45 bales per hour.

Since the year 1890 there has been a tendency to ship a heavier bale of greater density, and to meet this demand I designed a press capable of making bales up to 600 pounds in weight with a density of 60 pounds per cubic foot. I have made bales of 585 pounds weight measuring 9 1/2 cubic feet, but even yet the prevailing Indian bale is 400 pounds and 9 1/2 cubic feet. A few years ago I designed the Whitefield press capable of turning out about 30 500-pound bales of 8 1/2 cubic feet or 400-pound bales of 6 3/4 cubic feet.

It must not be forgotten that cotton when being pressed requires to be treated in a particular manner so as to preserve its full properties in a tightly compressed bale, and it is in the absence of that treatment so many presses have failed in giving a good sampling bale. Cotton pressing in India is nearly a century old, but it was not before 1870 that factories began to be established up country. Since then the development has been very great and still continues to expand as fast as railways open up the country to convenient and cheap transport.

The easy handling of pressed bales in tran-

sit by rail or steamer, freedom from loss in weight, reduction on risk of fire, and compact stowage on ship or warehouse, together with many other advantages makes it all the more remarkable why American exporters still adhere to the existing ugly, ill-shaped, loose and unwieldly so-called bale.

F. W. SHALLIS.
Whitefield Bank, Heaton Norris, Manchester, Eng.

AN ATTACHMENT FOR MAKING KNOTTED YARN.

A device for forming lumps or knots in yarn for the production of fancy effects has recently been patented in this country and is shown in the accompanying illustrations. The advantages claimed for the new method are simplicity of construction and adaptability to a wide range of effects. Fig. 1 shows a cross section of the attachment on a yarn twister of the ordinary type; Fig. 2 is a front view; Figs. 3 and 4, side and front views of the attachment separate from the

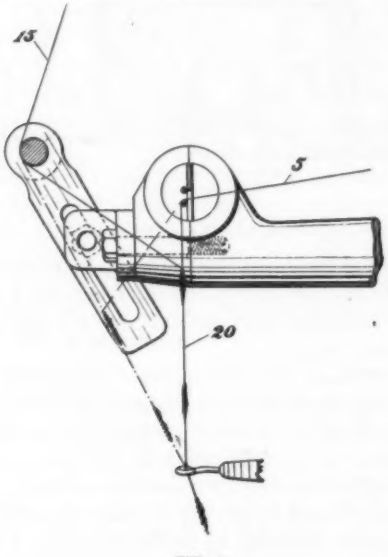


FIG. 3.

twister; Figs. 5 and 6, front and side views of the gearing to drive the knotter.

For giving an intermittent or variable speed of either of the pairs of feed-rolls the following mechanism is provided: To a suitable part of the frame is attached an adjustable arm, which is retained in position by a stud. A similar arm is also adjustably at-

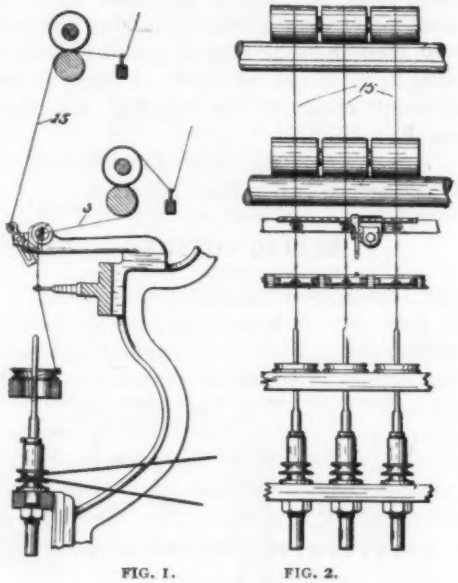


FIG. 1. FIG. 2.

tached to the casing by means of another stud. These arms are provided in their outer ends, respectively, with slots through which pass studs or bolts to retain in position the bearings for the gears. The gears are adapted to mesh with each other and may be made of different sizes, depending on the speeds desired to be transmitted to the feed-

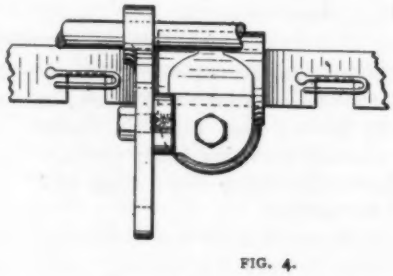


FIG. 4.

rolls. Upon the same stud or bearing and so connected as to revolve with the gear is a partial or mutilated gear, which is adapted to mesh intermittently with the connecting gear, carried by one end of the shaft of the lower feed-roll. The main driving-shaft of the machine carries a driving-gear. By this arrangement the three gears will give a continuous rotation to the mutilated gear. As this gear revolves, the blank and toothed por-

tion will alternately come opposite to the driven gear and will cause it to have an intermittent motion, according to the relation between the blank and toothed portions of the mutilated gear. The feed-rolls will also have an intermittent motion.

Instead of the mutilated gear eccentric gears, Fig. 7, may be used. This latter arrangement of gearing will produce a similar effect upon the feed-rolls, with the exception that the motion will be increasing and diminishing gradually rather than by sudden rotations and stops.

Referring particularly to Fig. 3, it will be seen that as the strands of the yarn are twisted by the rotary motion of the spindle and traveler, and by reason of the relatively varying speed of the strands of the yarn, the strand will vary in tension, becoming alternately tight and loose during its forward motion, and as the feed-roll has a constant speed of rotation the strand, 5, will be alternately pulled and released by the strand, 15. The tightening of the strand, 15, will cause the twisted portion, 20, of the yarn, together with the untwisted portion of the strand, 5, to be pulled into the position shown in dotted and dashed lines in Fig. 3, while a loosening of the strand, 15, will again allow the yarn and strand to move toward the position shown in full lines in Fig. 3.

It will thus be seen that the strands while being constantly twisted reciprocate from one position to another, according to the retardation of the feed-rolls, thereby varying the angle of approach of one strand to the other. It is obvious that when the yarn, 20, and the strands, 15 and 5, are in the position shown in dotted and dashed lines the strands, 5, will be wound in closer turns upon the strand, 15. When the strands are in an intermediate position between these two extremes and have equal tension, the two strands will be wound equally upon each other, thereby forming an even and symmetrical twist in the ordinary manner. It will thus be seen that owing to the angle of the approach and the relatively intermittent feed motion of the strands the clouded or knotted portions in the yarn are produced by a very simple and efficient arrangement of parts. By an adjustment of the slotted arm the angles of the approach of the strands can be changed and different degrees in the sizes and arrangements of the enlarged or knotted portion of the yarn thus produced. It will also be obvious that a vertical reciprocating motion of the supporting-arm, as has heretofore been employed in some forms of twisting and doubling machines, is unnecessary, and by the simple attachment, including the adjustable slotted arm and the guide-rod the same result is attained in a very simple manner.

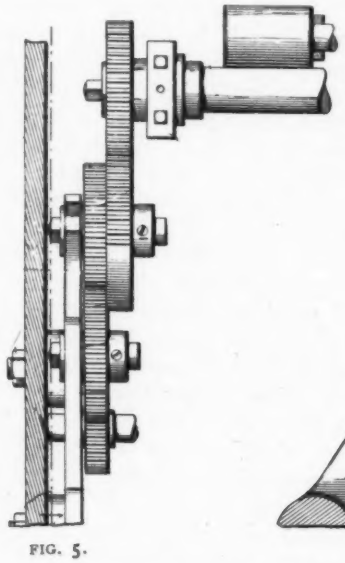


FIG. 5.

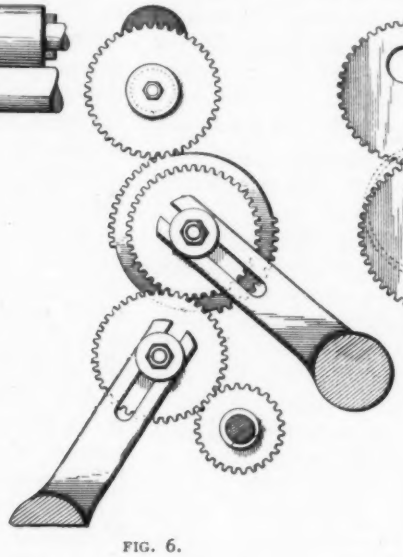


FIG. 6.

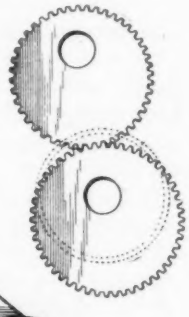


FIG. 7.

THE INDUSTRIAL CRISIS IN RUSSIA.

BY AN OBSERVER.

The state of unrest now prevailing in Russia is no doubt largely owing to the war and the necessity for calling out men as reservists who had occupations and settled down as family men. But in ordinary times there is an undercurrent of discontent among the industrial workers.

The working hours in Russia as in England have been reduced during the last ten years. At the present time the hours worked in Russian factories are from 6 a. m. to 12 m.; 1.30 p. m. to 7 p. m., for five days, and from 6 a. m. to 2 p. m. on Saturdays. This makes 65 1/2 hours per week. A large part of the machinery is standing while the workmen take breakfast and tea from 8 to 8.30 in the morning and 4 to 4.30 in the afternoon. If we take off these meal times it would reduce the hours worked to 60 per week.

As the mill engine keeps running work that can go on without much personal attention is continued during these meal times. Russian workers drink so much tea and require such an unlimited quantity of hot water that many prefer to have these meals in the mill. In order to dispel the idea that they all work 65 1/2 hours per week the engine should stop for these meal times and then the time run would be really 60 hours per week and all workers would be alike. Seven in the evening looks a late hour to cease work, but so long as one hour and a half is allowed for dinner instead of one hour, and tea is taken in the mill, it will continue. The Russian likes to sit over his tea and often the half hour does not satisfy. If the mill engine stopped for half an hour it would define the time and there would not be very much work lost if the time was shortened in this way.

We cannot impose the same conditions and hours of labor in all countries; for instance, many of the Russians employed in the construction of buildings almost hibernate in their villages during the winter and work very long hours in summer. We have never recommended long hours of labor as they are often the cause of lessened energy. When there has been only a small reduction in the working hours English weavers and other piece workers have often averaged the same quantity of work as before, their regularity and punctuality and a little extra energy making up the difference. The present demand for an 8-hour working day in Russia is too idiotic to be for a moment entertained, especially as the worker expects to receive the same amount of money as he had been receiving for longer hours and without a thought of putting forth any more energy.

The idea prevails that the Russian workman gets very low wages. Some of the day laborers do get small pay for the hard work they do, while others get the same wages for a minimum quantity of work. Heredity seems to retain in the mind of the Russian peasant the vassal idea that prevailed on a nobleman's estate before the emancipation of the serfs, that a man must be kept alive; that he must never be dismissed; that the quantity of work done does not matter. The only thing he is alive to is the desirability of higher wages, as he is a free man. A Russian workman often takes his dismissal as a great grievance, although circumstances may not admit of his profitable employment. Wages must, however, always bear some relation to the work done or responsibility.

A Russian weaver attends two looms and earns about $3.00 per week, that is half the amount of money that is earned by an English weaver who minds four or five looms. A Russian weaver says he is not going to kill himself to keep himself and at places where the weavers were tried with more looms the work was so inferior that they had to be put back to two looms. It was the same with the Macclesfield silk weavers; they would only mind one loom until they were compelled by the competition of the Elberfeld German weavers to mind two looms. But those who earn the lowest wages are not the most discontented, as has been well illustrated in the recent strikes. Most of the mechanics at the Putikoff works earn not less than $31.00 per month, and considering the quantity of work done by some Russian workmen this is not bad pay. The Russian workman is not a bad sort and is often skilful, but, owing to the lack of education, is somewhat simple minded and like

the Doukhobors in Canada he does not rest contented when he is doing well and is easily led astray by unwise advisers, gives way to drink and then acts foolishly.

There are no well regulated trades unions in Russia and they have no funds to maintain a strike, the reason being that they cannot trust each other with money. They have agitators who are well posted up in the amount of wages earned by all kinds of workers in England and America, but these men carefully conceal any reference to the quantity of work done for the amount of money paid. These men also promise to get the workers exorbitant compensation for any injuries they may sustain and in the end pocket two-thirds of the money that has been obtained. In Russia least of anywhere are the workers likely to benefit by the revolutionary methods usually advocated by these agitators. The Russian workman left to himself is a peaceful loyal subject and he should be aided by a board of conciliation on the lines of the famous "Brooklands agreement," so that he may be well advised when asking for more wages. In England no stone is left unturned to avoid strikes as these lessen the chances of profitable working, both for employer and employe. The Russian worker should be fairly dealt with and as a poor man he should be protected by law. On the other hand employers must have the law so administered that it will be possible for them to enforce proper discipline. The workmen are acting against their own best interests when they begin dictating to their masters. Improved conditions can only be looked forward to when mutual benefits are considered.

Foreign capital is necessary to develop new industries in Russia, but they are not encouraged as in some other countries and education in Russia is not so far advanced as to be independent of foreign direction.

According to the census of 1900, the textile industry of the United States stood first in the number of employees and third in the value of the finished product.

A substitute for mercerization has recently been found by which the material is treated in the raw state instead of in the yarn or piece.

REEDS AND THEIR USES.

BY S. B. H

Anyone at all conversant with the manufacture of any class of textile fabrics knows what an important part the "reed" or "slay" plays in the turning out of a perfect piece of goods. The position of the reed in its relation to the fabric market is a most important one. One hardly knows what must have been used in ancient times when textile manufacturing had not assumed that state of perfection that we see today, but as its present sphere of operation only concerns us at this writing, we will look at the reed in its relation to the manufacturer and weaver of today.

The use of reeds in one form or another seems to have been in vogue from the commencement of weaving. They were not always in the same form as at present, nor in the same position in the loom, nor did they always serve the same purposes entirely as at present, and, therefore, were not always as useful. The present purposes of the reed are: 1. To separate the ends and arrange them in their required places in the cloth. 2. To serve as a guide for the shuttle on its passage across the loom. 3. To beat up the weft to the preceding picks. 4. To serve as a gauge by which the fineness or quality of the cloth may be determined. In many cases the reed also has much to do with the question of the weaver's wage.

Formerly reeds were made of rushes, strips of cane or wood, or any other material that would serve the purpose of separating the ends of the warp, but now steel or a good quality of iron wire is used. When weaving with wet weft, reeds with brass wire are often used. It is always advisable to have a good quality of reed wire, otherwise the cost of new reeds will form a considerable item in the working expenses of the shed. Reeds should always be sufficiently deep to allow of a shed suitable for the shuttle, without the top yarn touching the top of the reed. In many cases the recent attachment of shuttle guards makes the substitution of deep reeds for narrow ones advisable, as some forms of the guards are apt to come into contact with

the temples. When the shuttle guard is fixed too high in order to avoid the temples, its original purpose is departed from.

Many cloths contain so many ends that the yarn is reeded three, four, or more ends in a dent. The appearance of the cloth is generally better when a finer reed is used and fewer ends in a dent, but soft or inferior yarns often require a coarse reed with more ends in each dent. When cloth is taken off the roller and placed on the counter, the side of the cloth generally contains one or two ends per inch more than the middle. This is owing to the contraction of the cloth being more at the sides that at the middle of the cloth. To equalize this contraction, what are called bastard reeds are sometimes used; they contain about two dents less per inch at the sides than at the middle.

Striped cloths often contain more ends per dent in some stripes than others; for instance, cloths with alternate plain and twill stripes may be reeded: plain stripe, 2 ends per dent; twill stripe, three ends per dent. Some cloths such as gauzes, lenos, mock lenos, etc., which have a very open or perforated appearance, have empty dents at certain intervals, so as to aid the effect of the peculiar system of drafting the yarn as by crossing, or the peculiar weave of the mock leno.

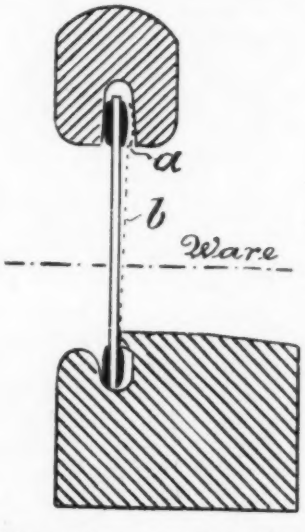
The reed being used as a guide for the shuttle, necessitates that some attention be paid to the position and method of affixing the reed in the lay and the lay cap. The centre of the reed should be a little further back than the sides, as this enables the shuttle to be kept against the reed on its passage across the loom. The broader the loom the greater the bend of the reed. Care must be taken that the ends of the reed do not project in front of the box-backs, otherwise the shuttles will not run straight, and indeed may be thrown out.

The reed should not be held tight in the lay or cap except when cracks or raised places in the cloth are being made. On the other hand the reed should not be very loose. When beating up the reed should be vertical or upright when at the fell of the cloth; sometimes the weft is slightly cut or frayed when the reed beats up, if inclined at an angle.

The dents of reeds made of inferior wire often break near the selvages, and especially is this the case in frosty weather. All overlookers are expected to be able to repair a reed when a few dents are broken, but when a reed has been repeatedly repaired, the best plan is to discard it entirely.

FILLING STRIPES IN WOVEN GOODS.

There are many things that may cause filling stripes in goods woven on power looms, such for instance, as worn shafts on the beam and improper working of the take-up and let-off motions. It is also well known that filling stripes may be caused by letting the loom stand several hours. In some cases filling stripes are caused by the weaver leaning heavily on the cloth when replacing a broken thread. In one case a stripe was caused in a cotton fabric woven with a



5-leaf filling satin, every time the loom was stopped and started. On investigation it was found that the reed was not fastened firmly there being a space (a) which allowed the reed to move back and forth, and endways as well. The difficulty with stripes disappeared when the reed was properly fastened.—Translated by the Textile World Record from Leipziger Monatschrift fuer Textil-Industrie.

Questions and Answers.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Textile Analysis.

Editor Textile World Record:

Will you state the best method of determining from a small sample the weight per yard and the size of the yarn of which it is composed? I have frequent occasion to analyze competing fabrics and need a simple method adapted for the mill, by which I can determine quickly and accurately the construction of a textile fabric. Please illustrate your method by a fabric weighing 3.75 grains per square inch, having 108 ends of warp and 96 picks of filling per inch. Manufacturer (564).

A sample with an area of 4.32 square inches (1/300 square yard) is cut by a die, which for that purpose may be 1.8 in. by 2.4 in. or 1.2 in. by 3.6 in. The weight of such a sample at the inch rate given by Manufacturer is 16.2 grains. This grain weight indicates the weight in ounces per yard 52 1/2 inches wide, that is, 16.2 ounces. The weight for any other width is calculated by simple proportion. Thus for 56 inches:

$(16.2 \times 56) \div 52.5 = 17.3$ ounces per yard 56 in. wide.

The size of the yarn by the cotton system (840 yards per pound) is calculated by dividing the threads per inch by the weight of the sample (4.32 sq. in.) in grains. The 108 ends of warp and 96 picks of filling combined make 204 threads per inch both ways.

Then:

204 (threads) ÷ 16.2 (grains) = 12.6, average cotton No.

If the sizes of warp and filling are to be found separately the sample is raveled and each kind of yarn weighed. Assuming the warp to weigh 8.7 grains, the filling 7.5 grains the sizes are found as follows:

108 (threads) ÷ 8.7 (grains) = 12.4, cotton No., warp.

96 (threads) ÷ 7.5 (grains) = 12.8, cotton No., filling.

If the size by the worsted system is wanted, multiply the cotton size by 1 1/2; if by the cut or linen system, by 2.8, if by the run system, by .525. Thus for the average size:

$12.6 \times 1\frac{1}{2} = 18.9$, average worsted No.

$12.6 \times 2.8 = 35.3$, average linen No.

$12.6 \times .525 = 6\frac{5}{8}$, average runs.

If the sample contains yarns of different sizes in either warp or filling, the count of each is found by counting and weighing each kind and calculating the size separately. Assume for example that every third thread of warp is of a different size from the rest, and that this yarn, which we will call A, weighs 3.2 grains. Then:

36 (threads per inch) ÷ 3.2 (grains) = 11.2, cotton No., A warp.

In the case of special sizes like the preceding, the count can also be found as follows: Assuming for example, there are 86 special warp threads in the width of 2.4 inches, each 1.8 inches long, the total length of the yarn will be 155 inches. Then:

155 (inches) ÷ 3.2 (grains) = 48.4 inches per grain.

48.4 (in. per grain) ÷ 4.32 (inch-grain basis of cotton count) = 11.2, cotton, No., A warp.

This is a system of analyzing textile fabrics that the editor of the Textile World Record has tested for many years in mill work. It is simple and accurate, enabling the busy designer or manufacturer to determine the construction of most fabrics in 15 minutes to half an hour. The selection of an area of 4.32 square inches is due to the fact that the cotton No. indicates the number of 4.32-inch lengths per grain. The count as calculated indicates the size of the yarn as it lies on the cloth. To determine the spun count allowance must be made for take-up, shrinkage in length and loss in weight between loom and case. If the goods are weighted the sample should be scoured and dried before the analysis.

Sizes of Cordage and Binder Twine.

Editor Textile World Record:

What system is used for indicating the size of binder twine and cordage? Ropewalk (563).

The size of binder twine is indicated by the number of feet per pound, this being one of the few cases where the foot is used for measuring textile material. There are four standard sizes of binder twine, viz.: 500, 550, 600 and 650 feet per pound; 600 feet (200 yards) per pound is equivalent to 1/8 run.

The size of cordage is indicated by the circumference or diameter in inches. In addition to these sizes the weight in pounds of 200 fathoms and the length in feet of one pound are also given. For example, a Manila rope measuring 1 3/4 inches in circumference and 9/16 inches in diameter may weigh 125 pounds per 200 fathoms and measure 10 feet per pound.

Needle Felting Machine.

Editor Textile World Record:

What firm builds a machine for stitching a fibrous lap on a woven cloth face for horse blankets?
Felting (555.)

The machine mentioned in this inquiry is built by the Curtis & Marble Machine Co., Worcester, Mass. It is made with a needle board filled with several thousand barbed needles which move rapidly up and down and interlace the woolen fibres into the woven foundation cloth. It is used for horse blankets, skirtings, felting, etc., and is built in different widths as required.

Taffeta.

Editor Textile World Record:

Please let me know if the enclosed sample can properly be classed as taffeta. If not what is it?
Cocoon (501).

The sample of silk enclosed is known commercially as taffetaline or tamtine. It is made from a waste silk product known by the trade as schappe, and is extensively used for a variety of purposes, but principally for lining skirts. There are a number of qualities on the market, ranging from 19 to 50 cents. Such goods as the N Dura at 34 cents and the Antherea at 41 1/2 cents sold by Duncan and Stinz through Broesneck, Broesel are of this variety, also the Samson silk sold by Burton Bros. at 42 1/2 cents and the Radium silk sold by the Gilbert Mfg. Co. at 40 cents.

Knickerbocker.

Weight of Shirtings.

Editor Textile World Record:

Are shirtings sold by standard weights, and if so, what are they? Spring (543.)

We are informed that the only shirtings sold by standard weights are the Homespun or Nigger shirtings, so-called. These are known in the trade as 3, 3 1/2, and 4-yard goods and are sold principally to cutters.

Strength of Mercerized Yarn.

Editor Textile World Record:

I noticed the query in your April issue regarding the strength of mercerized yarn. Recently I made some tests to determine the effect of mercerizing on the count of the yarn and the results indicate that there is a loss of 7 1/2 to 10 per cent. That is, 100s before mercerizing will reel 90 to 92 1/2 after the process. Practical.

Cotton Goods in Asia Minor.

Editor Textile World Record:

We purchase annually from Europe and India from 25,000 to 30,000 pounds of cotton yarn of various sizes and weave it on very simple hand looms into a common kind of cloth worn by the people in this country. I would like to get into communication with American spinners with a view of purchasing this yarn in your country. There is no cotton spinning industry in Asia Minor and we are therefore compelled to look to other countries for our supply, which comes chiefly from Europe. Within a few years a trade in coarse Indian yarn has been developed. I shall be pleased to hear from any American spinners that are interested in the foreign trade.

Vahan Michaelian.
Merzifoun, Turkey, Asia Minor.

Rolling of the Warp.

Editor Textile World Record:

We are making goods with a 4-leaf basket weave and reed the warp four threads per dent in a 12 1/2 reed. The two threads that work together in the same dent cause trouble by rolling around each other. We cannot use a 25 reed with two in the dent as that is too fine. Can you suggest a remedy for the trouble? Alpha (547).

An experienced weaver answers this question as follows:

I know of nothing which can be positively stated to prevent the rolling or overlapping of threads in a basket weave; sometimes even a finer reed fails to do it. I have tried many things and have succeeded in the majority of cases, but, to be candid, I must say that I do not know how the result was accomplished. Among the things I have tried with success are the following:

A pair of leese rods separating the threads; staggering the harness, that is, one a trifle higher than the other alternately; setting on the top the harness with the threads that tend to creep under; and a fine reed. I believe a 25 reed two in a dent would give the most satisfaction.

Practical.

Setting Warper Blades.

Editor Textile World Record:

Can you tell me how to figure on the setting of the blades on a horizontal warper, if the silk yarn runs up one inch on the blades every 100 yards?
Cabot (559).

It is not possible to give a set rule. It must be left solely to the judgment and experience of the warper, as it will vary not only according to the length of the warp but also to the density of the ends per inch and it is these two factors combined that have to be considered. Alfred Coradi.

KNITTING DEPARTMENT.

For Knitting Mill Machinery, Equipment and Supplies, see pages 232 to 253. Also Buyers' Index.

KNIT GOODS SITUATION.

Duplicates on spring lines placed during the month of May figured up into a good volume of business, notwithstanding the fact that the weather conditions were considerably against it.

A scarcity exists in some lines, particularly in ladies' white lisle vests at from $1.75 to $1.90 and more particularly in men's balbriggans from $1.80 to $2.00. In the latter mentioned, we have in mind one jobber who carries three numbers of these goods that retail at 25c., but he has been unable to show a complete line of sizes in any one of them for some weeks past. This has been occasioned by manufacturers turning part of their machinery on to winter weights, thereby curtailing their production of light weights, so that they cannot make prompt deliveries.

Interest has now turned to duplicates on fall lines and selling agents report that there has been more demand for fall goods during the past two weeks than at any time since the early selling season closed. This has been brought about by careful study on the part of interested buyers of the possibility of mills to make prompt deliveries. No doubt exists now that a number of buyers have yet to place considerable business on fall lines, and they now find they have made nothing by waiting, as they cannot get any lower prices than their competitors who bought some weeks ago. In fact, they are in a worse position, owing to their being obliged to take later deliveries than they would had they placed their orders earlier.

On the other hand, manufacturers who took large blocks of early business on ladies' medium and low priced ribbed goods at close figures to satisfy buyers, have found that they have not been able to buy material at correspondingly low prices and now state that they can see no profit on the goods they are now making. Fortunately, this is not true of the many other manufacturers who make other classes of goods. It is believed they are in much better position in this respect and it is the opinion of many that the season will wind up with about as large business as usual with an increased percentage of profit over last year.

Some manufacturers of wool lines have notified their trade of advances from 50c. to 75c. per dozen on all lines of natural wool and camels hair goods and absolute withdrawal of all scarlet numbers, made necessary by the advance in the cost of raw materials. One manufacturer expresses regret of the necessity of taking this step, but states the present prices on wool prohibit him from offering goods or accepting orders, except at the advanced figures.

Manufacturers and selling agents are now giving their attention to lines for spring of 1906 and at this writing some lines of spring goods are being shown, but we cannot learn that any great volume of business is being placed as yet. It seems altogether too early for jobbers to take up this matter, while there is still another month's business to be done and stocks are bound to change considerably in that time. Manufacturers who make both heavy and light weights are not yet giving much attention to the spring lines, but there are some few who make only light weights, and they are making flying trips and endeavoring to create an interest among large buyers. In doing so they are quoting lower prices than those made at the beginning of last season.

One large western manufacturer has been showing his line in the east recently and an examination shows that he has made great strides in producing his class of merchandise. He shows a full trimmed vest of good width at 52 1/2c.; a lisle finish garment at $1.05, with plain mercerized edging; a mercerized garment in Richelieu and two and two stitch with mercerized tape at $1.65, and also a shaped lisle garment with long and short sleeves at $1.90.

We have also seen a line of lace trimmed

combination suits at $1.90 and one with torchon lace trimming at the knee at $2.40. The same manufacturer shows a very attractive line of lace trimmed pants at from $1.25 up to $1.90 and one with torchon lace, but with string band at $1.90.

HOSIERY.

It is generally accepted that the hosiery business has not been up to last year's average, but it is claimed by many that it has its redeeming features in that the manufacturer's margins have been somewhat better. The fact that buyers did not operate as freely as desired early in the season, did not have the effect of upsetting prices to any great extent and manufacturers did not make up stocks on which to take losses. The effect of this will probably be seen in a cleaning up of the market and making good the chances of another season's business.

New York jobbers cleaned up their stock of hose and half hose in the month of May and while only fair prices were realized, Chicago and St. Louis jobbers followed suit, and with stocks of light weights down to the bare tables, as is now indicated, it looks as though the coming season for spring would be an exceptionally good one.

At the present time a scarcity still exists in ladies' and children's tan hose, and manufacturers are being rushed on all sides to turn out these goods. Whites are also very scarce and buyers are taking rounds of sizes wherever they can find them.

Lace goods give every indication of being just as popular in 1906.

Advices have already come from the German hosiery centres to the effect that the production of lace goods is being rapidly sold up and a warning is being given to buyers to place their orders at once in order to procure early deliveries.

A great many gauze lisles are still being sold, but retailers are having no end of trouble with them on account of their having no durability. The public continues to ask for them and they cannot be made too light and gauzy.

It would seem as though the designers' ideas must be about exhausted in getting up patterns for fancy hose, yet the new styles continue to come.

BLOUSES.

There is a growing interest exhibited by retail buyers in blouses and sweaters and salesmen report that a larger business has been booked so far than ever before.

New things are being added to the line and one of them is a very heavy weight blouse for invalids taking fresh air cure out of doors in winter. These garments weigh five to six pounds each and retail at from $15.00 to $18.00.

Another new garment is a combination of blouse and vest. The vest front is attached on the inside with hooks and eyes and the garment may be worn either with or without the vest attachment. It is also fitted with a detachable sweater collar, practically making three garments in one.

BRANSON MACHINE CO.'S FULL AUTOMATIC MACHINE.

We take pleasure in illustrating for the first time the latest full automatic knitting machine, the product of the well-known Philadelphia knitting machine builders, Branson Machine Co.

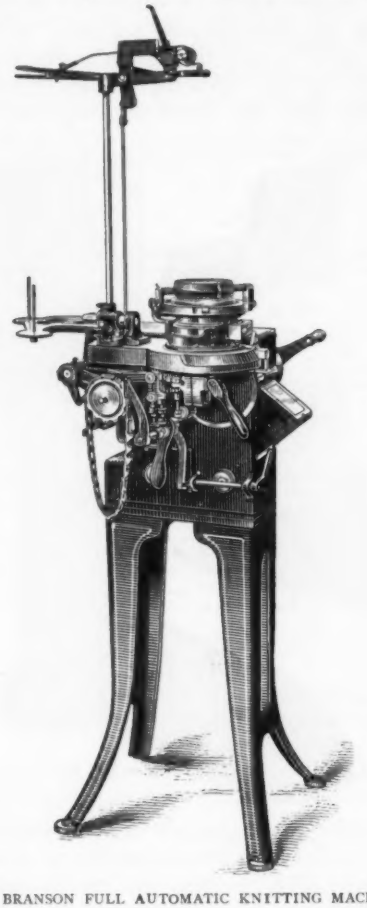
As will be seen at a glance, it is unusually compact and self contained and is extremely simple. It is arranged in such a manner that it will be equally well adapted to ladies' hose or transfer work, and half-hose tops may be transferred either by means of the duplicate cylinder method or by quill ring transfer points. It is also equally well adapted to plain knitting or lace effects in various patterns.

It operates rapidly through all its changes without any loss of time going immediately from circular or reciprocity motion and back again to the circular motion after the heel and toe have been completed without the slightest hesitation or jar. There are many radical changes from the usual method of procedure which must be seen properly to be appreciated.

The heel and toe are formed by a single needle picking device which is in contact with the needles at no other time excepting while doing the work of elevating or depressing the needles and then does not come in

contact or touch any other needle than the one operated on.

The yarn changing device is very simple and effective. The builders believe that no other knitting machine has ever been placed on the market accomplishing the same results with so few parts and with no parts



THE BRANSON FULL AUTOMATIC KNITTING MACHINE.

which could by any possibility be called weak, and even the needles themselves are so protected that they may be placed in any position from the highest to the lowest and the power thrown on without any hesitation and without the slightest damage or danger to any needle in whatever accidental position it may be placed.

The Branson Machine Co. are not new in the knitting machine business nor are they new in the building of full automatic knitting machines, as they have in their factory three other full automatic machines of different construction built with the possible view of placing them on the market but were not satisfied to do so, because they believed they were not fully equal to the reasonable demand of the hosiery manufacturers. Now, however, they place this machine on the market with just pride and every confidence in its great success and true merit.

Prospective purchasers are invited to call and see the machine in operation at the office of the Branson Machine Co., 506 N. American Street, Philadelphia, Pa.

AN IMPROVED METHOD OF KNITTING FULL FASHIONED HOSIERY.

This machine for which a patent has recently been granted to Robert W. Scott, of Scott & Williams, Philadelphia, is intended to simplify the manufacture of full fashioned hosiery. The stocking is formed by a continuous operation on a single machine and the shaping is accomplished without transferring stitches from needle to needle. A stocking made by the new process is shown at Fig. 1. It has a shaped calf, a square heel with a rounded lower corner, instep gussets, a seam across the front of the toe, and another seam where the heel-strip is joined to the foot; otherwise the stocking is seamless.

The stocking has bordering-wales, 2, on each side of a central line running from the point of the toe under the toe and foot and up the back of the heel, ankle, calf, and leg of the stocking, and in its preferable form the fashioning or shaping of the different parts of the stocking is effected by a widening operation, the various widening-wales being introduced between the standing-wales of the fabric and the bordering-wales. The knitting of the web is commenced at the toe, and the machine is provided with two parallel needle-beds, 10, carrying the needles upon which the standing wales and widening-wales of the fabric are produced, and a pair of short needle-beds, 11, carrying the needles upon which the bordering-wales are produced. These short needle-beds are susceptible of movement longitudinally along

the needle-beds, 10, and the needles or some of the needles of the latter are so controlled that they can be moved into and out of operative position and when moved from operative to inoperative position may be caused to retain or cast their stitches, as desired. In starting the knitting operation only the needles, 10, from (a) to (a') will be in operation, together with the needles, 11, as shown in Fig. 2; the yarn-guide will travel in a continuous course about these needles—that is to say, it will pass to the right along one needle-bed and then across to the other needle-bed, pass to the left along the latter, and then across to the first needle-bed, and continue as before.

The result of this operation will be to produce a narrow band of standing wales, 12, at the top of the toe, having on each side a band of bordering-wales, 2. As soon as the knitting begins, however, the bars, 11, are racked in the direction of the arrow (x) Fig. 2, to the extent of one needle at a time, and needles, 10, are successively brought into action at each end of the set of needles (a a') until the full amount of widening for the toe has been effected, by which time the relation of the bordering-wale needles to the needles, 10, will be that represented in Fig. 3, the needles of each bed from (a to b) being in action.

The toe is thus produced in the form of a properly shaped or fashioned but seamless tubular web, and the knitting of such seamless tubular web of uniform width for the foot of the stocking now proceeds until the point is reached at which it is desired to introduce the instep-gussets, 5, whereupon there is a further intermittent racking out of the bordering-needles, 11, and a further introduction of successive needles, 10, of each bed until the desired width of gusset has been formed, the relation of the bordering-wale needles to the needles, 10, being that shown in Fig. 4 and the needles, 10, from (a to d) of each bed being in operation. The needles, 10, of each bed from (a to c), Fig. 4, are now put out of action, but permitted to retain their stitches, and tubular web is produced upon the needles from (c) to (d), and upon the bordering needles. This method of knitting is continued until a few courses of stitches have been knitted upon these needles, such as shown at 13, Fig. 8. The needles, 10, from (d) to (e) Fig. 4, and the bordering-needles now cast their stitches, and the bordering-needles, 11, are racked in to the point (e), as shown in Fig. 5. Both sets of needles, 10 and 11, are then projected and a single course of stitches is formed by feeding the knitting-yarn for such course to the needles of both beds prior to the knitting of a tubular web upon the needles from (c) to (e) and upon the bordering-needles. This

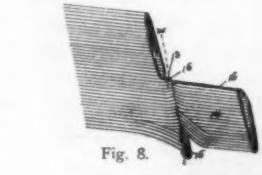


Fig. 8.

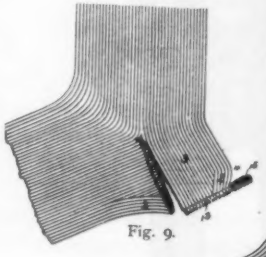


Fig. 9.

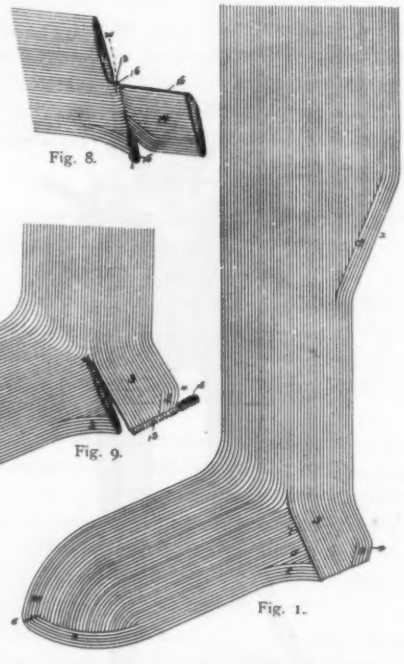


Fig. 1.

web is gradually increased in diameter by introducing needles, 10, in succession beyond the point (e) and racking out the bordering-needles, 11, correspondingly until the desired shaping of the web for the corner of the heel has been effected—say until the needles from (c) to (f) Fig. 6, have been brought into action—whereupon the knitting of the tubular web is continued upon the needles from (c) to (f) and upon the bordering-needles until a web of the desired depth for the heel of the stocking has been produced. If the stocking-web is now removed from the needles of the machine, it will present the appearance shown in Fig. 8, the tubular foot-

web having projecting from its lower half a contracted tubular web, 13, from which projects a shaped tubular heel-web, 14, said web being closed at its junction with the web, 13, and a partial course of stitches, 15, being presented around the lower half of said web, 13.

Owing, however, to the fact that the stitches have not been cast from the needles from (a) to (c) the course of stitches constituting the web, 13, and the heel-web, 14, will in actual practice be crowded or pocketed

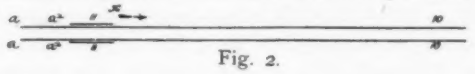


Fig. 2.

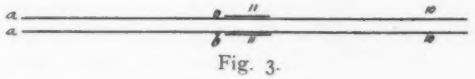


Fig. 3.

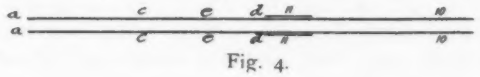


Fig. 4.

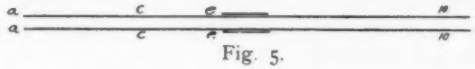


Fig. 5.

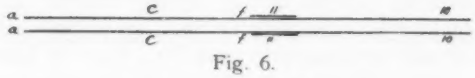


Fig. 6.

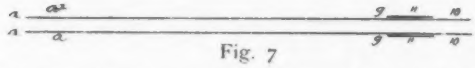


Fig. 7

between the two needle-beds. Hence if the needles from (a) to (c) are now again brought into action the production of seamless tubular web for the ankle portion of the stocking will be effected, the relation of the bordering-needles, 11, to the needles, 10, being that represented in Fig. 6. When the desired length of ankle-tube has been knitted, needles, 10, beyond the points (f) are successively brought into action and the bordering-needles are racked outwardly until the desired widening of the seamless tubular web for the calf portion of the stocking has been effected—say until the needles, 10, from (a) to (g) Fig. 7, are in operation—whereupon the knitting of seamless tubular web upon the needles, 10, from (a) to (g) and upon the bordering-needles, 11, is continued until the desired length of tube for the stocking-leg has been produced, whereupon all of the needles, 10, from (a′) to (g) Fig. 7, are thrown out of action and caused to cast their stitches, the bordering-needles, 11, are racked in to the point (a′) and the production of another stocking-web in the same manner as before is begun.

After the completion of the stocking-blank the web, 13, is severed on the line (w w) Fig. 8, as are also the stitches, 16, of the webs, 13 and 14, the blank being now in the condition shown in Fig. 9. The stitches of the web, 13, which extend around the rear end of the sole portion of the foot-tube are then run upon the needles of a looping-machine, together with the stitches at the severed edges, 17, of the heel-web, so as to unite the heel to the sole by the side seams, 7. The stitches of the web, 13, which project beyond the closed bottom of the heel are then raveled out, after which all that remains in order to complete the stocking is to unite the edges of the web across the front of the toe as shown at 6, Fig. 1.

The purpose of casting the stitches from certain of the needles, 10, and the bordering-needles and racking in the bordering-needles, 11, before beginning to knit the heel-web is to effect a narrowing of the ankle portion of the stocking, it being desirable that this portion of the stocking shall not be of as large diameter as the gusseted or widened rear portion of the foot of the stocking. Of course if the narrowing of the ankle in respect to the gusseted portion of the foot is not desired the retiring of the needles from (d) to (e) and the racking in of the bordering-needles before beginning the knitting of the heel-web need not be resorted to.

Instead of forming the heel-web as part of the continuous web in the manner described all of the stitches from (c) to (d) may be cast from the needles, 10, after completing the formation of the web 13. The bordering-needles may then be racked in to the point (e) and the knitting of a heel-web upon the needles from (c) to (e), and upon the bordering needles may be proceeded with by first forming a "setting-up" or closing course for the bottom of the heel by forming stitches upon both sets of needles, 10 and 11,

and these proceeding with the formation of the tubular heel-web, this web being shaped as before until the desired widening of the web has been effected and the knitting of the web being then continued until the proper length for the heel has been produced, whereupon the needles from (a) to (c) are restored to action and the knitting of the ankle-web proceeded with.

It will be noticed by reference to Fig. 1 that the fashioning of the toe is effected by a single group of parallel shaping-wales on each side of the same, these shaping-wales being introduced in quick succession, so as to impart the desired sharp rounding to the toe, all of the shaping-wales of each group running to or starting from the bordering-wales, 2, at the bottom of the foot.

It is claimed that a stocking can be knit more rapidly by this process than by the ordinary full-fashioned method. Furthermore, the fact that the stocking is largely seamless materially reduces its cost by rendering unnecessary the relatively expensive seaming operations necessary for closing the bottom of the toe, foot, and heel and the back of the heel, ankle, calf, and leg of an ordinary full-fashioned stocking.

The front edges of the heel-web, 14, produced in the manner described will be unselvaged—that is to say, they will present raw edges caused by the severing of the sinker-wales, 16, of the tubular web, 14, constituting the heel-blank; but if it is desired to form a heel-blank with selvaged front edges this may be readily effected by traversing the yarn-guides successively forward and back along each needle-bed, crossing at one end only, and a selvaged web, 13, can, if desired, be formed in the same manner.

The average daily wages paid to mill operatives in Japan is 16 cents for men and 10 1/2 cents for women. Children receive 3 1/4 cents per day. The mills run 22 hours per day with two shifts working 11 hours each.

Richard Ardict of Dewsbury, sent a rag picker to this country in 1831, soon followed it, and started the first shoddy mill in this country at Marlboro, New York.

MANAGEMENT OF A HOSIERY MILL.

BY HENRY BROUGHAN.

The requirements of a hosiery mill manager are probably as exacting as in almost any trade. The continual fluctuation of the markets controls the cost of the product to such an extent that profit and loss seem to depend entirely upon when the supplies and raw materials were purchased. The cotton and yarn markets are most important and good judgment must be shown in taking advantage of them or all other efforts will be of no avail. It is not a wise plan to sell goods with the intention of buying cotton later in the season to cover. It is much more desirable to have a selling price based on a fixed price for the raw material, even with a small percentage of profit, than to run the risks of speculation. There are other supplies, dyestuffs, oils, belting, rope, box materials, etc., that fluctuate widely and afford opportunities for the shrewd buyer. A small difference in the cost of any of these supplies, used so largely in a mill, will be a large item during the year.

Summer is a good time to contract for dyestuffs. For a mill using aniline salt blacks this is especially true, as aniline salt will almost invariably be at its lowest in June or July. By buying the salt at this time, together with the other chemicals needed for the year, a large saving can often be made on the entire lot.

For the medium sized mill two important items are the cost of printing and boxes. A mill making over a thousand dozen a day can profitably operate a box manufacturing plant with a printing department as an addition. Straw boards can be purchased at reasonably low figures, and by buying in sufficiently large quantities glazed papers may be imported by the manufacturer at a considerable saving. By buying in this way and with a two or three thousand dollar box plant, boxes from an average No. 45 board and lids from No. 60 can be made at a cost of $12 to $18 per thousand. A substantial saving can also be made in the cost of labels and bands. The size and style numbers can be printed on the labels, giving a much better looking box and facilitating the sale of the goods.

Some people wonder how it is that so many mills running on a class of staple goods continually lose money. They frequently close down for lack of orders while their neighbors run full time and make money. This is often due to the mistakes of an incompetent manager in placing goods on the market, frequently ruining his prospects for the season and sometimes playing havoc with the entire market. For example he offers his spring and summer goods for the following season about June 15 or July 1. The goods do not sell freely and he becomes uneasy for fear the mill will not be sold up and concludes his prices are too high. A cut of 2 1/2 to 5 cents follows and his product is sold. The market opens up well later in the season and he has to refuse business at better prices than he accepted at the start. If the mill is an important one a cut has to be made by its competitors and profits are thus sacrificed. If the jobber pays 75 cents for a 2-pound hose this year he is not going to pay to the same man 75 cents next year if the market has declined enough to warrant a 2 1/2 cent reduction. The basis used one season will be expected for each following season.

It is said that the very finest cambric or linen of the present day looks coarse besides that produced on Egyptian looms in the time of the Pharaohs.

More than three-fourths of the world's exports of cotton goods are supplied by Great Britain and India. England is also far in the lead in the export of woolens and worsteds.

DOUBLE THREAD PLUSH KNITTING.

BY F. W. HERINGTON.

This fabric is called "double thread" because two threads are used for the face. Plush knit goods are also made with only one thread on the face, and are called single plush. An additional thread is used for the back of the fabric, which is called the backing. This construction is also known as fleece knitting and stockinette cloth. It is called plush and fleece because the backing thread is napped or fleeced, after knitting, which produces a plush on the back similar to a plush woven fabric. There are two separate threads used for the face, which is made with the plain stitch. The backing thread is interlaced with one of the face threads, called the binding thread, because it binds the backing thread to the face of the fabric. To produce plush knitting, using spring bearded needles, two separate sinker burrs or wheels are required to carry the two separate threads into the needles for the face. This is done in the same manner as for the plain stitch. An additional wheel is necessary to put the backing thread between the needles so as to be knit with the face. This is done by a backing burr or wheel, which presses back every third needle, the thread being carried down in front of one needle and back of the next two, Fig. 90 E. The thread after leaving the backing burr lays between the needles as shown in Fig. 90. Another burr or wheel, called the clearing wheel and set so as to follow the backing burr, carries the backing thread to the bot-

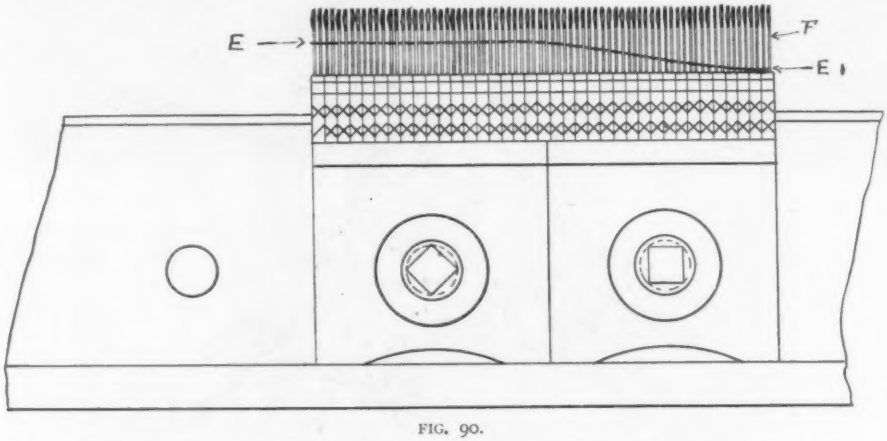


FIG. 90.

tom of the needles, Fig. 90 E 1, where it remains until it has passed under the first sinker burr Fig. 79, which feeds the first of the face threads, and afterwards becomes the binding thread. The backing thread is then carried up again by a landing wheel, while at the same time a needle presser closes the beards of the needles, Fig. 65, D and P, so as to allow the backing thread which lies in

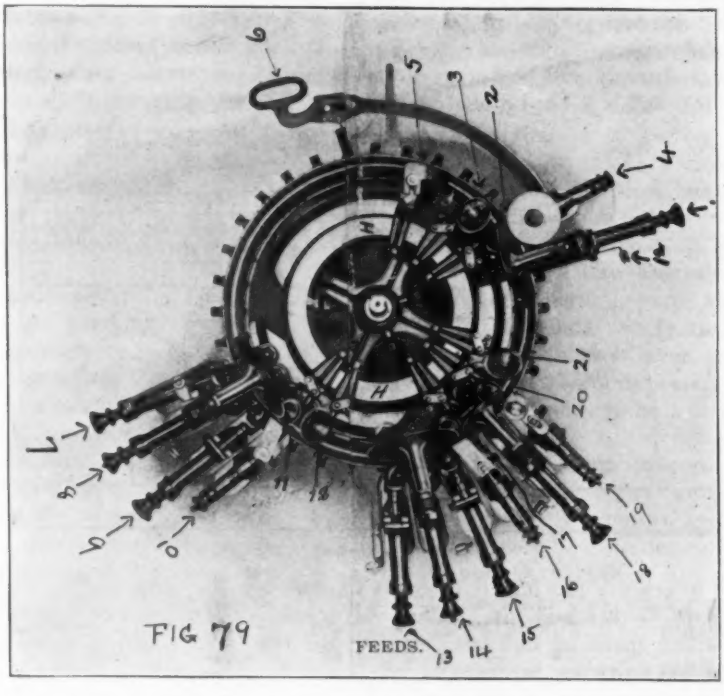


FIG 79

front of the needles, or in front of every third needle as shown in Fig. 90, to be carried up nearly to the tops of the needles, or above the position the backing thread occupies on the needles after it has left the backing burr, Fig. 90 E, when the backing burr is putting in the backing thread in front of one needle and at the back of the next two needles.

The backing thread is left in this position on the needles until after it passes the second sinker burr, Fig. 79. The sinker burr throws it partly off the needles and when it reaches the cast-off burr, it is cast off together with the plain stitches of the face as in plain knitting, and thus becomes interlaced with the binding thread, the second face thread being added to the binding thread. The two face threads are used in order to make a smooth face on the fabric, as only one thread is necessary to bind the backing thread to the face.

Where only one thread is used on the face the work is called single plush. The backing thread, being bound between the wales is forced through to the front of the fabric; this is covered up by using the second face thread. Fig. 91 is an illustration of double plush showing both back and face of the fabric after being knit, and before it has been napped or fleeced. Fig. 92 shows the face and back, the back having been napped.

Double thread knit plush has been made in the United States for over twenty years. When it was first made it was called stockinette cloth and was used very largely in the manufacture of ladies' stockinette jackets, newmarkets, etc., and also for men's underwear. After a few years the demand for it ceased for ladies' jackets, while its use for men's underwear increased. It is now known extensively as fleece lined or fleece underwear. It is also used in Canada for men's, ladies' and children's underwear, but is not

used very much in the United States for ladies' wear.

The ladies' so-called fleeced underwear is made with the ribbed stitch and not in the plain stitch.

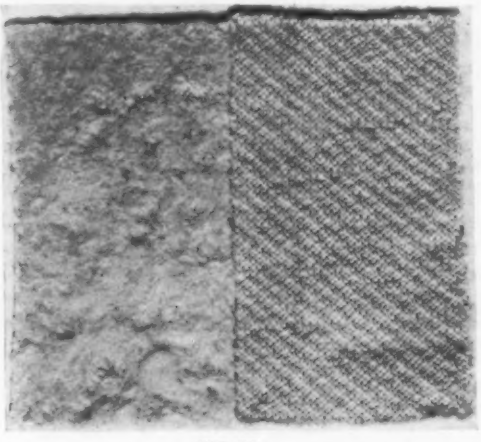


FIG. 91.

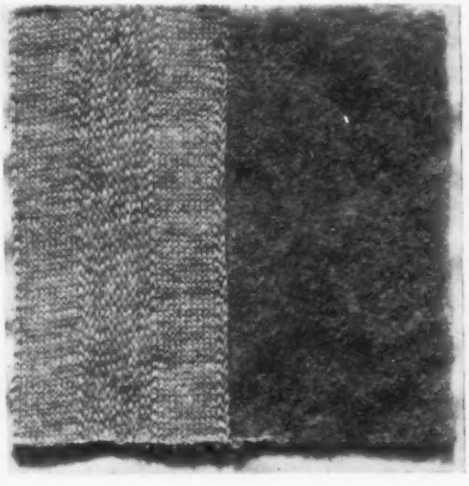


FIG. 92.

Fig. 93 is an enlarged sketch of double plush knitting. A and B are the two separate face threads. The heavy line, C, represents the backing thread. The connection, at D D, shows the manner in which the backing thread is stitched to the binding thread, A. Fig. 90 is a section of a needle cylinder and needles. The black line, E, running through the needles, F, shows how the backing thread is put around the needles by the backing burr. It passes in front of one needle and at the back of the next two, and so on. The backing burr presses back every third needle, and while it is held back the wheel carries the thread down and leaves it in the position on the needles shown at E, Fig. 90.

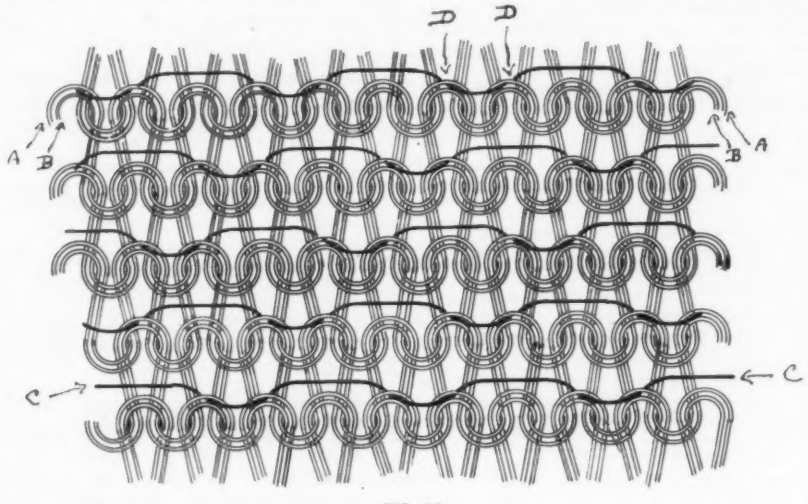


FIG. 93.

Fig. 93 also shows the backing thread, C, lying across two loops or stitches. The backing is placed at the back of two needles. The connection at D D, shows the backing thread, which has been in front of one needle, after it has been cast off the needles and

thus held or interlaced with the binding thread, A. The backing thread, C, being generally a much heavier or coarser thread than the face threads, will lie close to each other, as shown in Fig. 91.

Fig. 92 shows that the binding of the backing threads runs diagonally across the back. Fig. 93 also shows the binding loop at each course to be one needle to the left of the previous course. This is done in conjunction with the second face thread in order to make a smooth face.

Waste in Knitting.

Editor Textile World Record:

Noticing the inquiry of Investigator (480) in your issue of February, I take pleasure in submitting the results of a test as to the waste made in knitting. It covered a period of ten weeks and was made without the knowledge of any one connected with the knitting department. This test was made in a men's ribbed underwear mill manufacturing heavy weight goods from yarn on cones, backwinding on winder all yarn that did not run freely from the cones. The 2 per cent. allowances universally deducted from yarn invoices for cones, is not a cost factor or a waste factor in a knitting department. All yarns should be charged to the knitting department on the basis of the net weight specified in the invoice. As I know from actual tests the 2 per cent. allowed by yarn manufacturers is ample to cover the weight of the cones, tissue paper in which the yarn is usually wrapped, and the paper with which the cases are lined.

Following is the record of waste made in our knitting room:—

WASTE MADE IN KNITTING PROCESS.

Week ending		Yarn Knit	Waste Wt.	Waste %
March 5		11,643 lbs.	135	1.16
12		12,433 lbs.	136	.96
19		12,346 lbs.	131	1.06
26		12,678 lbs.	75	.59
April 2		13,450 lbs.	53	.39
9	(5 days)	9,201 lbs.	42	.45
16		13,685 lbs.	50	.36
23		14,224 lbs.	43	.21
30		13,922 lbs.	47	.33
May 7		15,244 lbs.	53	.34

Nantucket.

Splicing Yarn.

Editor Textile World Record:

What is the best yarn for reinforcing the heels and toes of hosiery? Nazareth (544).

A knitter informs us that both 50s and 60s yarn is used for this purpose and that he prefers 50s.

Lafayette writes us as follows: I have used 60s on 208 needles, 4-inch, but with 18s cotton. 2/30s on 176 needles would be as fine as 208 needles 4-inch; and 13s cotton on 3 1/2-inch 176 needle is about as heavy a yarn as could be run so a very fine splicing thread is all that could be used.

Pressing Hosiery.

Editor Textile World Record:

What is the best way to press hosiery?
Munster (534).

For all worsted hosiery I have found a light hot press changing to cold to give the best results, and for worsted and cotton mixed, a light hot press. There are many different methods, and every overseer thinks his is the best. I have taken goods and put them through one way with excellent results, and the next day the same grade of goods put through the same process would come out wrong. Only the man on the spot can keep things straight. Harper.

Bleaching Worsted Underwear.

Editor Textile World Record:

What is the best method of bleaching infants' worsted underwear with peroxide of hydrogen so as to obtain a clear white? Our goods are coming out slightly yellow. Norfolk (523.)

The fact that the goods are coming out slightly yellow would indicate that they were not left in the solution a sufficient length of time, that the solution was not quite strong enough, or that the bath was too alkaline. Articles on bleaching with peroxide of hydrogen will be found in the December 1903, and April, 1905, issue of this journal.

Palmetto.

Recent Knitting Patents.

KNITTING MACHINE. Circular. 790,672. William T. Barratt, Bennington, Vt., assignor to Charles Cooper. Bennington, Vt.

KNITTING MACHINE STOP MOTION. 790,604. Thomas W. Tustin, Hoffmann, Pa.

KNITTED FABRIC. 789,581. Louis N. D. Williams, Ogontz, Pa., assignor of one-half to Robert W. Scott, Philadelphia, Pa.

KNITTED FABRICS. Making Elastic. 788,997. Wilhelm Boettger, Jr., Apolda, Germany.

KNITTED HOSIERY. 789,635. Robert W. Scott, Philadelphia, Pa., assignor to L. N. D. Williams, Ogontz, Pa.

STOCKING. Elastic. 788,996. Wilhelm Boettger, Jr., Apolda, Germany.

KNITTED FABRIC. Sectional Roll of. 790,771. Frank B. Wildman, Norristown, Pa.

KNITTED FABRICS. Cutting and Winding Mechanism for. 790,770. Frank B. Wildman, Norristown, Pa.

KNITTING MILL NEWS.

New Mills.

*Alabama, Talladega. The Highland Hosiery Mills, recently organized with capital of $50,000 to operate a knitting plant at this place, have changed name to the Selocta Hosiery Mills. Work will start at once on erection of a new building, 100 by 50 feet. Sam Goldberg is president of the company and W. H. Boynton, secretary and treasurer.

*Georgia, Columbus. C. L. Perkins is president of the Perkins Hosiery Mills, recently reported incorporated with capital stock of $75,000; R. C. Jordan, vice-president, and H. M. Wade, treasurer. This plant, upon which construction work will start at once, will be equipped with 3,000 spindles and 150 machines, for making hosiery and other knit goods.

*Georgia, Macon. Operations have been started in the new plant of the Southland Knitting Mills, making ladies' cotton underwear. This company is capitalized at $30,000. E. Lee Campe (New York) is president of the company, J. S. Buad, treasurer and J. W. Hanson, superintendent. Plant is equipped with 35 knitting and 50 sewing machines and operated by steam. A dye house is also attached. Goods are sold through Hecht & Campe, 97 Franklin St., New York. The above company purchased the Schofield Manufacturing Company's plant.

*Iowa, Shenandoah. The new plant of the Shenandoah Knitting Mills is expected to be in operation July 1st.

*Massachusetts, Taunton. Further particulars in regard to the Taunton Knitting Co. are to the effect that the initial installation of machinery will provide for a production of 250 dozen per day of high grade knit underwear, employing about 150 hands. William Hurd, the manager, whose present address is Millbury, Mass., expects to have the mill in readiness to begin operations not later than August 1st.

*Michigan, Saranac. The Saranac Knitting Company will start operations about June 1st, in their new mill, making hosiery. This company is capitalized at $10,000; Edwin Wallington is president of the company; B. N. Talcott, vice-president; H T. Johnson, secretary; W. E. Densmore, treasurer, and C. O. Gunther, manager. Will sell direct.

North Carolina, Albemarle. The Lillian Knitting Mills Company has been incorporated with capital stock of $25,000. J. M. Morrow, A. L. Patterson and R. A. Crowell are interested.

*North Carolina, Hillsboro. The Bellevue Manufacturing Company contemplates having the plant ready for machinery about July 1st.

*Pennsylvania, Avon. Light & Bomberger's Hosiery Mill, recently destroyed by fire, is to be rebuilt on a much larger scale.

*Pennsylvania, Macungie. John Rems & Sons, successors to the underwear department formerly operated by R. F. Moyer & Co., will operate their plant under name of the Macungie Knitting Mill. They have an equipment of 13 knitting and 14 sewing machines making ladies' and children's underwear.

Pennsylvania, Philadelphia. An application for a charter has been made by the Boardman Knitting Mills. This concern will take over and operate the plant of the Standard Knitting Mills, 10th and Diamond Streets, which is operating 24 knitters on women's and misses' ribbed underwear. It is the intention of the new company to continue the manufacture of this class of goods but of a higher grade of cotton worsted, silk and lisle. The capital is $50,000 and the officers: president, Joseph L. Behal, the proprietor of the Standard Mill; vice-president, Edwin Boardman; secretary, Herbert Boardman, the present superintendent of the plant; and Charles C. Widmayer, treasurer. The goods are sold through New York.

Pennsylvania, Philadelphia. The Zenith Mills, with Ralph Hirsh and Sol. Dryfoos, proprietors, has started up at the S. W. corner of Mascher and Somerset Sts., where they will have 15 looms. Six looms have already been installed and are now in operation with 9 still to come, which have been ordered. Mr. Sol. Dryfoos will be the superintendent and buyer. They will manufacture curtains and draperies of cotton mercerized and silk, selling direct.

*Pennsylvania, Philadelphia. The International Silk Knitting Co. recently reported in these columns as about to start up in the knitting business, have now secured quarters at the N. E. cor. of Jasper and York Streets, where they will operate six full fashion machines, three of which are now being set up and three more to come which they expect to receive within a few days. The company has a capital of $25,000; the president of company is Joseph Scholes, and William J. Geggis, treasurer and buyer. They expect to have the plant in full operation by June 1st. The goods will be sold direct.

Pennsylvania, Philadelphia. With a promise of becoming one of the largest manufacturers of knit gloves in the United States, Messrs. T. D. Weston & Son are about to start up a plant for the knitting of worsted and cashmere gloves at 1115 South 15th Street. Mr. T. D. Weston, who will have charge of the establishment, is from Leicester, England, where he has for many years been manager of the knitting mill in which this class of goods have been produced. He has brought with him from England 15 tons of the latest improved machinery with several more to come, which he is now having set up and expects to have in operation within a week turning out, at first, about 500 dozens per week. The quarters now occupied by this concern are only temporary, the idea being to remove the plant to another location when a building can be secured for the purpose. The goods will be sold direct and made up of worsted and cashmere yarns 18 to 28/2.

Pennsylvania, Philadelphia. V. A. Zerby, 3129 West Cumberland Street, and two other parties, contemplate the starting of a knitting plant for the manufacture of half hose, in the western part of

the State. Mr. Zerby is now looking up machinery for same.

Pennsylvania, Philadelphia. The Hall Hosiery Company, with a capital of $50,000, has applied for charter for the manufacture of knitted goods. This concern has purchased the entire plant of the Brown & Hunt Co., at Front Street and Lehigh Avenue, consisting of 250 knitters, 3 welters and 9 embroidering machines, which the new company will operate on Ladies', Misses' and Men's seamless hosiery, laces and plain. James Hall, John Hall, connected with the James Hall Carpet Co., Front and Lehigh Avenue; Edwin W. Harrison and Joseph Gee are the incorporators. Mr. Gee was at one time in the hosiery business in Frankford, but until recently employed by the Brown & Hunt Co., will superintend the new plant. The goods will be sold through New York. The Hall Co. will take over the plant on July 1st next.

*Virginia, Norfolk. The Northside Knitting Co., which was recently reported incorporated under Alexandria, will operate mill at this place, having purchased the knitting mill property at Lambert's Point. It is expected that the machinery will be installed and the plant running by June 1st, making underwear, with capacity of 200 suits a day. R. H. Riddleberger is president of the company; F. H. Brayton, secretary and treasurer, and A. W. Chapin, superintendent.

*Virginia, Norfolk. The Northside Knitting Mills, which recently purchased the knitting mill property at Lambert's Point, contemplate having the plant in operation in about two weeks.

*Wisconsin, Marinette. The Marinette Knitting Mill, which has but recently started operations, is increasing the plant gradually, manufacturing sweaters exclusively. Eight additional machines (ordered) will be installed, giving the plant a total of 21.

Enlargements and Improvements.

Connecticut, Shelton. An addition, 36 by 103 feet, two stories, is to be erected for the Radcliffe Bros.

*Georgia, Grantville. The Grantville Hosiery Mills, recently reported to install plant for spinning yarns and about 25 additional machines, will add 50 new machines instead. The new building will be 290 by 80 feet, one story.

*Georgia, Rossville. The new addition to the Richmond Hosiery Mills, for purpose of adding 5,000 spindles to make their own yarns, will be 100 by 200 feet, two stories, brick.

Indiana, Fort Wayne. It is reported that the Wayne Knitting Company held the annual meeting of the stockholders May 9th to authorize issue of $275,000 preferred stock for purpose of taking up the bonded indebtedness and making certain much needed extensions.

Massachusetts, Lowell. Work will start at once on erection of a new addition to Mill No. 3 of the Shaw Hosiery Co.'s plant.

*Massachusetts, Northampton. The McCollum Hosiery Company reported building a new mill, will add 31 new spindles and 10 new knitting machines. Silk hosiery, caps, tights, etc., are made.

Michigan, Centreville. An addition is being built to the Michigan Central Knitting Mills. They will install an additional set of carding and spinning machinery.

*New Hampshire, Ashland. The Ashland Knitting Company will make extensive repairs to the plant during the first two weeks in July. This will include the installation of a new boiler, previously reported to be put in.

New Hampshire, Laconia. The Pitman Manufacturing Co. has recently added 50 Mayo knitting machines.

New Hampshire, Lakeport. H. H. Wood & Son are to erect a new mill on site of one destroyed by fire, two years ago. The building will be 118 by 54 feet, three stories and basement.

New York, Little Falls. The Gilbert Knitting Co. proposes erecting a new building and increase the capacity of the plant.

New York, Philmont. A new steam boiler has recently been installed in the High Rock Knitting Company's mill.

North Carolina, Winston-Salem. Additional knitting machines are to be installed in the Shamrock Knitting Mills, manufacturers of fine gauge hosiery.

*North Carolina, Littleton. A new building, 25 by 50 feet, will be erected by the Littleton Hosiery Mills and equipped for dyeing and finishing purposes.

Pennsylvania, Adamstown. A new mill is under construction for Mohn Bros.

*Pennsylvania, Allentown. In addition to the new dye house, now under construction, the Southdown Knitting Company will also erect a drying room, 50 by 100 feet, to be equipped with the latest machinery.

Pennsylvania, Harrisburg. It is reported that Frank T. McElroy, of Steelton, is to erect a three story building on Mulberry Ave., where capacity of mill will be double present one. The building will be 100 by 50 feet, and work on same will be started as soon as specifications and plans are prepared.

Pennsylvania, Lebanon. Contract has been let for erection of a new building for the Hawk Knitting Company. Capital stock has recently been increased to $40,000.

Pennsylvania, New Cumberland. The New Cumberland Knitting Mills are to instal about 150 new machines, which they propose having in operation some time during June.

Pennsylvania, Norristown. Rambo & Regar Inc., proprietors of the Globe Knitting Mills, in which they manufacture ribbed hosiery on 500 knitters, are to have erected a four story addition 46 by 64 feet, to their already large plant and a one story boiler and engine house, 24 by 43 feet including a radial brick stack 128 feet high. The plans are by Ballinger & Perrot, Philadelphia architects.

Pennsylvania, Philadelphia. Messrs. M. A. Metz & Brother, manufacturers of ladies' and misses' blouses and sweaters, bootees and sacques, hoods, fascinators and fancy goods, have removed their establishment to new, enlarged and up-to-date quarters at 310 to 314 North Orianna Street, where they are operating 25 knitters, 15 sewing, two spooling and three button-hole machines by steam, employing 200 hands. Their goods are sold direct and through agents in New York and Chicago. They are very busy and are running their mill full time.

Pennsylvania, Schuylkill Haven. A new brick mill is to be erected for J. F. Bast, manufacturer of women's cotton ribbed vests and union suits.

*Pennsylvania, Reading. Work has been completed on an addition to the Reed & Leininger Mills. The power plant has also been increased by addition of a 50 horse power engine and new boiler. Twelve new machines have been added.

Virginia, Berkley. The Elizabeth and Chesapeake Knitting Mills, owned by William Sloan & Co., are to be enlarged. An addition of 150 feet will be made to the Chesapeake plant for a stock room.

Tennessee, Madisonville. The Madisonville Knitting Mills are making extensive repairs and additions to the plant. The production will be greatly increased by addition of new machinery.

Mills Starting Up.

*New Hampshire, Laconia. William Clow & Son, whose plant at Lakeport was destroyed by fire, are now occupying the plant formerly run by the Laconia Woolen Co., and known as the old Guilford Hosiery Mill. Plant is equipped with 75 Acme and 14 Excelsior knitting machines, 50 ribbers, 5 sets cards, a picker duster and dye plant. Cousins & Carroll, department Wm. Iselin, are the selling agents.

*New York, Honeoye Falls. The Ideal Knitting Company, formerly at Rochester, N. Y., has removed plant to this place, where it is now in operation. The capital stock has been increased from $5,000 to $15,000 and additional machinery will be installed for making ladies' hosiery. M. Biswanger is president of this company, A. M. Holden, vice president and D. P. Cahill, secretary, treasurer and manager.

*North Carolina, Rocky Mount. The Rocky Mount Hosiery Co. has begun operations in their new plant. It is reported that they contemplate installing some spinning machinery in the mill.

Facts and Gossip.

*Canada, Montreal. The Montreal Blanket Co.'s mill was erroneously reported damaged by fire.

Connecticut, Torrington. It is reported that the Belfast Mesh Underwear Company will move the plant at Poughkeepsie to this place.

Georgia, Macon. The Southland Knitting Mills have been incorporated with capital stock of $30 000 for purpose of manufacturing knit goods. Robert E. Hightower, James J. Cobb and Leon S. Dure (Macon) and E. Lee Camp (New York) are interested.

*Iowa, Spencer. We have been advised that nothing has been done regarding the proposed knitting mill.

*New York, Little Falls. We have been advised by the Gilbert Knitting Company that they do not propose erecting a new building at present, nor increasing the production this year.

Pennsylvania, Lykens. A charter has been granted the Lykens Knitting and Manfg. Co. with a capital of $20,000.

*Pennsylvania, Macungie. R. F. Moyer & Co., who will continue operating the Valley Mills on hosiery, will operate 48 knitting machines, using yarn, 6 to 11 in white and 1/2 mixture. L. J. Riggins is selling agent.

Pennsylvania, Reading. Andrew E. Vaughan, president and superintendent of the late Ponemah Knitting Co. of Philadelphia, has been engaged by the Reading Hosiery Co., manufacturers of men's seamless cotton half hose of cotton, wool and worsted on 300 knitters, to superintend their establishment. Mr. Vaughan, who is an expert on this line of work, is now in charge and reports the factory to be in good working order and very busy.

Pennsylvania, Shamokin. It is reported that I. W. Forry & Son, manufacturers of boys' hose and men's half hose on 200 knitters, whose plant was recently destroyed by fire, are looking for a location in Reading or one of the surrounding towns, where a new factory will be built and started up in the same line of business. Mr. Forry is a resident of West Reading.

*Pennsylvania, Steelton. We have been advised by Frank T. McElroy, that although he contemplated building in Steelton, he has decided to endeavor to secure location elsewhere, where he can employ from 70 to 100 girls.

Pennsylvania, York. J. A. Hutchinson is reported as interested in a new plant to be erected for manufacturing hosiery.

Personals.

Edwin Boardman, for some time in charge of the knitting department of the Elk Knitting Mills, Philadelphia, has resigned to become one of the officers of the new Boardman Knitting Mills which has commenced its operations on ribbed underwear at 10th and Diamond Sts.

Percy A. Simmons has accepted a position with the Elk Knitting Mills, Philadelphia, Pa. He was formerly of Providence, R. I.

W. C. Curtis, recently of Newberry, S. C., has been made superintendent of the Dallas (Ga.) Knitting Mill.

Charles Fox Salisbury died at St. Johnsville, N. Y., recently. He organized the St. Johnsville (N. Y.) Knitting Company four years ago, and subsequently conducted the Erie Knitting Mills, Amsterdam, N. Y.

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices, and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.
We invite machine builders and others to send us such information for this department.

Flexible Spindle. John Hetherington & Sons, Manchester, England. (S. C. Lowe, Boston, American agent.) An improved cotton spindle adapted to any method of oiling. The spindle embodies several novel features and has been thoroughly tested in English mills with satisfactory results.

Roll Cleaning Device. The American Mule Cleaner Co. of West Medway, Mass., is putting on the market a device for cleaning the rolls of mules. It works while the machine is running, and it is claimed that one cleaner will keep the rolls clean on two or three mules. The price is low, and the cleaners are working successfully in a number of mills.

False Reed. The Emmons Loom Harness Co., Lawrence, Mass., are introducing a false reed made of thread and finished the same as their regular loom harness. It is placed back of the metal reed and its object is to clear or separate the warp threads before the latter pass through the metal reed. It is specially adapted for silk weaving, but would no doubt be useful in fine cotton weaving.

Loom Guard. Woonsocket Loom & Press Co., Woonsocket, R. I., are introducing a loom attachment for preventing shuttle smashes. When the shuttle is caught in the shed the reed is loosened and as it yields to the pressure of the shuttle the breaking of the cotton is prevented.

Wool Dryer. James Keith & Blackman Co., London, England. An improved wool dryer which is built for direct connection with the scouring machine. It is said that the construction permits close regulation of the temperature and as a result the wool is delivered in much better condition than from an ordinary dryer.

Yarn Dyeing and Bleaching Machine. J. Ellis, Huddersfield, England, has recently placed on the market an improved machine for washing, bleaching or dyeing yarn in the hank.

Spool and Bobbin Rack. Ewald Pferdekampfer, Weida, Germany. An adjustable rack for holding spools and bobbins on the back of the rolls of a ring spinning and twisting machine. It can be adjusted at any position desired to meet the requirements of the different kinds of work.

Dyeing Machine for Yarn and Slubbing. Leon Detre, Rheims, France. A machine based on the circulating principle for coloring yarn and slubbing. It is said that a number of machines have been in operation in Rheims and Bradford and give excellent results.

Mercerizing Machine. Emil Kruse, Barmen, Germany. A mercerizing machine designed to affect a more thorough saturation of the yarn in the alkali liquor. For this purpose the skeins are run under two rollers in the liquor, which is said to give more uniform results than when a single roller is used.

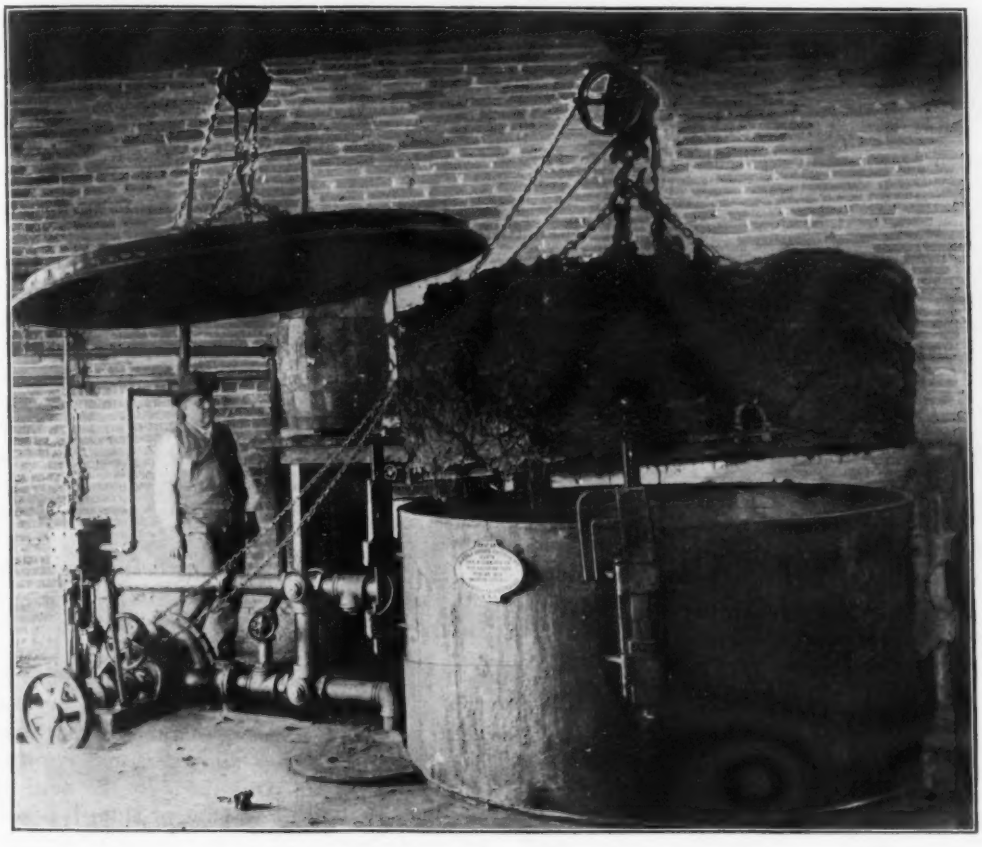
Guard for Cotton Lappers. The Brown-St. Onge Co., Providence, R. I., has recently brought out a device for preventing cotton laps from splitting. It is claimed that the guard condenses the laps so well that they are not stuck together as the lap unrolls.

Jacquard Card Tying Machine. Hermann Ulbricht, Chemnitz. A machine for sewing together the cards for jacquard work. It has been perfected after a long continued use in German mills, and is said to do the work of from 20 to 24 skilled workers.

THE LATEST VACUUM DYEING MACHINE.

One of the principal difficulties in dyeing loose stock is the rolling and matting of the material into lumps, which seriously impairs the spinning qualities of the fibres. This trouble accompanies any handling or poling of the stock in the liquor and is even caused by violent boiling. The only complete remedy is to color the material without agitating it and this is accomplished by pumping the boiling liquor through the mass of stock, which is packed closely enough to prevent any disarrangement of the fibres. By this means the material remains undisturbed during the dyeing process and is removed from the tub in the same condition in which it was entered. The dyeing machine built by the Vacuum Dyeing Machine Company, Chattanooga, Tenn., combines the advantages of the circulating process with an unusually convenient construction and efficient mechanical arrangement, which reduces the cost for labor and dyestuffs to a minimum.

The latest type of the machine is shown in the accompanying illustration. The tub has a loose false bottom, over which the stock is packed. A perforated cover is placed on top and securely fastened by large bolts and nuts at the side of the tub, thus holding the material in a compact mass. The liquor is then pumped into the tub and the steam turned on. When the tub is filled, the valves are turned and the pump forces the liquor under the false bottom and upward through the stock and cover, when it flows through an outlet at the side of the tub into the suction



THE LATEST VACUUM DYEING MACHINE.

pipe of the pump to be again forced through the stock.

In this way every fibre is subjected to the same treatment and the stock is colored a uniform shade throughout the batch. When, as is the case of sulphur colors, a standing bath is used, the liquor after being used once is pumped to a storage tank, from which it is drawn for the next batch. The machine is very easily loaded and unloaded. After the stock is packed in the tub, the cover, which is supported on an overhead track, is placed in position and as the liquor is forced through the stock the cover settles down into place so that by a few turns of the nuts it can be securely fastened. When the batch is colored and rinsed the cover is removed and the chain block hitched to the chain on the false bottom. The entire batch is then lifted from the tub and carried on the track to the extractor, where it is dumped. The bottom is then placed in the tub ready for another batch.

The removing of the stock from the machine after dyeing is done by the engine which operates the machine. There is attached to the main shaft of the pump a chain sprocket wheel and when the machine is ready to unload, the hand chain of the block, which removes the load from the machine, is thrown into this sprocket wheel and by running the pump this removes the load from the machine. This gearing is so arranged that the load can be stopped at any point by throwing it out of gear and can be lowered by the same means. This arrangement reduces the labor in handling the stock very materially, as the machine can be readily unloaded by a boy.

The machine is adapted for cotton, wool, shoddy and other loose material.

The writer recently saw a Vacuum machine in operation on sulphur black at the Taunton Dye Works & Bleachery, Taunton, Mass. The dyed cotton was uniform in shade and as loose and open when coming from the machine as when it was entered.

One of the advantages of the Vacuum machine is the small amount of repairs required. The pump, which is of the centrifugal type, and of the most approved construction, will run for years without other repairs than occasional packing of the boxes. All other parts of the machine are as durable as the ordinary open dye vat, probably more so.

The Vacuum machine is in successful operation in a number of leading mills, among which are: Tremont & Suffolk Mills, Lowell, Mass.; New England Cotton Yarn Company, Taunton, Mass.; The Woodstock Mills, Norristown, Pa.; Chas. Chipman Sons, Easton, Pa.; H. C. Jones, Conshohocken, Pa., and other large mills through the East and South.

WATER FILTRATION FOR TEXTILE REQUIREMENTS.

Two years ago we published through the columns of this journal a description of a filter plant erected by the Philadelphia Water Purification Co., 1700 North 12th St., Philadelphia, Pa. Since that time many of the textile mills in the Eastern states have installed filters operated on this system, both of the pressure and gravity type. The accompanying cut of a Hungerford-Elfreth filter plant shows a gravity system of four million gallons daily capacity, recently installed at the Newburgh bleachery, Newburgh, N. Y., for Joseph Chadwick & Sons. The water filtered at Newburgh contains considerable suspended matter, mostly of vegetable origin, and at times of low water develops considerable color.

The plant is placed at a considerable distance below the dam forming the lake that supplies the bleachery, and the water flows by gravity through a 20-inch cast iron main. The water first passes through the settling tank where a small amount of alum is added to precipitate much of the dissolved organic matter and bring the substances which give the water its color into a form in which they can be retained by the filter. The alum is automatically applied in the form of a solution and is readily controlled by the operator. The apparatus is installed under a guarantee that the free alum in the water will never exceed one part in five million, the equivalent of one grain in 2 3/4 barrels of water. The water is about fifteen minutes in passing through the settling chamber, which gives ample time for the required chemical action.

After passing the tank the water enters the filters, of which there are three, independently connected so that as many units as desired can be used. Filtration is downward through specially prepared sand, the water passing out at the bottom to a 20-inch collecting main which delivers it to the main

THE HUNGERFORD–ELFRETH FILTER PLANT IN THE NEWBURG BLEACHERY.

floor of the bleachery. There is a working head of 10 feet which is only slightly reduced by the filtration process, so that pumping is not necessary, the operation being entirely by gravity.

Considerable solid matter is removed from the water which would soon render the filters worthless if a very efficient system of washing were not employed. The filter to be washed is cut out, the others still supplying the bleachery with filtered water. A 30 H. P. engine, supplied with the filters, is then started up, which in its turn starts a centrifugal pump forcing water upward through the sand at the rate of 2,500 gallons of water per minute. This reverse flow raises the sand bed and loosens it to such an extent that the revolving wash rake can readily pass through it. This rake gets its power from the engine and is supplied with clutches for stopping and starting. Washing is complete in about seven minutes, after which the filter is started, the filtered water being run to waste for about three minutes to permit the wash water remaining in the bed to be discharged. The filter is then allowed to discharge into the collecting line and the washing process is complete.

A feature of this plant is that unfiltered water is used for washing. The great objection to the use of unfiltered wash water is not, as one might suppose, on account of the impurities of the raw water further fouling

the bed, but to the fact that the screens or strainers at the bottom of the filters become clogged with impurities and prevent proper distribution of the wash water with consequent imperfect washing of the filter and the ultimate destruction of the bed.

This trouble is entirely obviated in the Hungerford-Elfreth filters by means of a series of devices known as "sand valves." These valves form the strainer system of the filter, the office of which is to prevent the sand from running out of the filter with the filtered water. In addition they distribute the wash water uniformly under the bed in such a manner that it rises up through all parts of the bed at the same rate of speed. When an obstruction lodges in a sand valve, the increased resistance of the flow of water causes the valve to open automatically and discharge the obstructing matter into the sand, where it is soon ground up and washed away.

The advantages of using unfiltered water for washing are obvious. In the first place filtered water has a certain increased value over the unfiltered, so that the use of unfiltered water for washing makes a definite saving and besides does not deplete the supply of filtered water. Secondly, large reservoirs for the filtered water are not necessary, the water being delivered directly to the point of consumption and filtered as fast as required. Lastly, it simplifies operation and reduces the cost of operation and installation. The water filtered by this system is clear, free from all color and suspended matter and unchanged in its chemical composition.

These filters, as well as the Hungerford-Elfreth feed water softeners, are manufactured by the Philadelphia Water Purification Co., 1700 North 12th St., Philadelphia, Pa.

PORCELAIN GUIDES.

Textile manufacturers are commonly misled by the application of the word "porcelain" to pottery guides made with a cheap body having a glazed surface. When new the resemblance between common pottery and hard porcelain is very close and the difference between them cannot be detected even by an expert without breaking the material. There is a vast difference in the value of the material, however, for textile uses, and it is important that every manufacturer should understand what they are. The body and surface of common pottery vary in composition and are fired at different temperatures. The contraction and expansion of the two are different and this difference is what causes the fine cracks which are often seen in pottery and which are called "crazing" by the potter. Each of these cracks presents a sharp cutting edge to the yarn, and consequently much of the advantage of the smooth porcelain surface is lost by the use of common pottery.

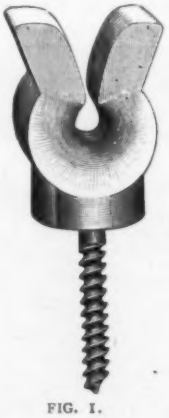


FIG. 1.

FIG. 2.

Hard porcelain on the other hand does not crack because the body and surface are homogeneous and there is no difference in the contraction and expansion of the different parts to cause a breaking of the surface. All parts are fused together in one mass at a high temperature and thus a smooth surface is produced which offers no resistance to the passage of the yarn. The thin glazed surface of the ordinary pottery guide allows the yarn to come in contact with the rough material of which it is composed.

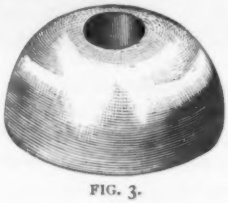


FIG. 3.

FIG. 4.

This explanation of the difference between porcelain and pottery guides gives the reason for the superiority of the guides made by the Mitchell-Bissell Co., 38 Murray St., New York City. For nearly twenty years

FIG. 5.

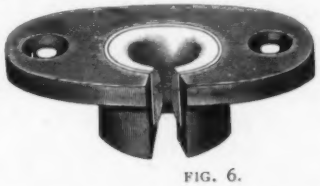


FIG. 6.

they have insisted on the advantage of using guides made of genuine porcelain and at present are prepared to supply the trade from their stock with nearly every form of guide required.

The illustrations show a few of the many styles designed for textile machinery. Figs.

FIG. 7.

FIG. 8.

1 and 2 are guides applicable for spinning and twisting frames, also silk reels and winders. Fig. 3 is a style of porcelain spool button desirable to use where it is required to

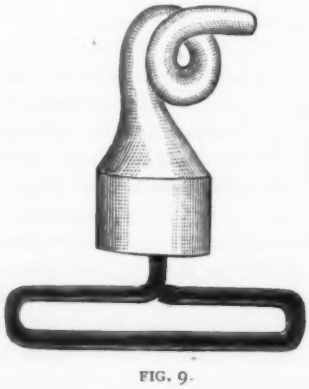


FIG. 9.

reduce the friction caused by the spool turning on a flat surface. By placing one of these buttons on a spool head the spool can be turned with very little resistance. They are adapted to twisters, silk warpers and doublers. Fig. 4 is a groove eye or ring applicable to many places where it is difficult to fasten securely a plain eye. They are specially designed for knitting and hosiery machinery.

Fig. 5 is one of the many types of worsted guides. Fig. 6 shows a porcelain guide set in an iron casting for worsted spinning frames. Fig. 7 is a guide for cops and bobbin winders. It is easily threaded while the machine is running. The slot is made fine and deep so that there is little possibility of the thread getting out of place and it

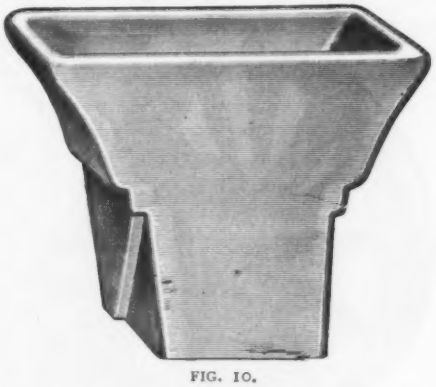


FIG. 10.

gives a close and positive delivery to the bobbin. Many makes of winders are now fitted up for these guides. Fig. 8 is what is called the U-guide. This type is largely used in hemp, flax and jute spinning machinery, though it is also made for spinning wool and worsted. Fig. 9 is a guide with an adjustable wire for double deck winders. Fig. 10 is a porcelain mouthpiece for a fulling mill of the Kenyon type. Other styles are made for different makes of fulling mills. They have adopted the many suggestions of their customers regarding the form and construction of their guides and now have nearly 4000 patterns designed solely for textile machinery, and are always ready to adopt new forms. Their large line and the high standard of workmanship which they maintain give them unequaled advantages in supplying the wants of textile manufacturers. They issue an elaborate catalogue showing illustrations of different guides and invite correspondence from manufacturers.

HURRICANE FANS.

DIRECT CONNECTED, MOTOR-DRIVEN.

It is more evident every day to the observant employer that it is to his interest to render his work-rooms as comfortable as possible for his employes. Comfortable work-rooms naturally result in higher working efficiency and also a better grade of finished product. These results, together with the fact that the health of the employes is considerably benefited, is sufficient inducement for any manufacturer to give serious consideration to the question of ventilation.

The "Hurricane" fans; of which two of the many styles are here illustrated, are built by the Philadelphia Drying Machinery Co., 6721 Germantown Avenue, Philadelphia, Pa. Both are arranged with a direct-connected motor-drive. While the Philadelphia Drying Machinery Company also build a great variety of belt-driven fans, the rapid increase in the introduction of electrical power has created quite a demand for a first-class motor-driven fan and mills that are now supplied with current appreciate the great saving and convenience which this method of power transmission renders possible. Where it is more convenient to support the motor and fan on a rigid base, the No. 7 fan is usually employed, but in a great many cases, it is found more convenient to instal the No. 8 fan. In the latter instance, the motor is rigidly supported from the square fan case and it can be readily seen that it is a comparatively easy matter to mount the latter in position in the majority of places where fans are required.

The Hurricane fans are built in a strong and substantial manner, the sheet steel blades being securely riveted to a cast iron centre, after which they are very accurately balanced, so as to ensure ease of running. This style of fan wheel has been in successful use for a number of years among the representative mills in this country and abroad and is the outcome of practical experience in ventilation, coupled with the results of many experiments with the object of securing a fan that will move the greatest volume of air with the least possible consumption of power.

TWO STYLES OF THE "HURRICANE" FANS, DIRECT CONNECTED AND MOTOR-DRIVEN.

The motors are specially built for the severe service to which fans are frequently subjected and are designed to withstand a large percentage of over-load. Where the fan and motor are to be mounted in a dirty or dusty place or where there is an excessive amount of moisture, the motor can be enclosed, if desired. In order to ensure cool running, the bearings are amply large and are well lubricated by means of loose rings which rotate in reservoirs filled with oil. The bearings are also constructed so that the motors may

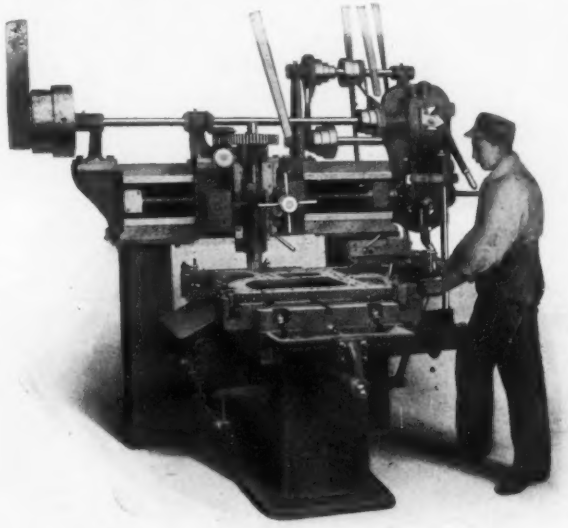
be mounted upside down or at right angles to the position shown in the illustrations.

On account of the great variations in temperature and atmospheric conditions generally, it is a great advantage to be able to regulate the volume of air moved according to the conditions existing at different times during the day's work. It is possible, however, to obtain a considerable variation in the speed of the fan by means of a speed regulator, which is a part of the standard equipment furnished and by this means it is also possible to operate the motor and fan at their most economical point. The latter apparatus is so arranged that the fan may be driven at any desired speed within the range of the speed regulator, which latter is provided with an automatic release to stop the motor and fan automatically, in case the circuit is momentarily opened.

The Philadelphia Drying Machinery Company manufactures such a variety of sizes and styles of fans that it would be well for those interested to write for the latest edition of their booklets describing in greater detail the general construction of the different types. The manufacturers will be pleased to furnish all necessary information upon request.

MILLING LOOM FRAMES.

The castings assembled into ordinary machinery are a foundry product, and necessarily vary more or less in many important details. Difference in the heat of the melted metal and variation in the rapidity of flow and strains of cooling, are bound to warp and twist the finished product more or less, in spite of care. If to these reasons is added the differences introduced by old foundry practice, in handmade molds with uniform patterns, the errors are necessarily multiplied.



MILLING A LOOM FRAME.

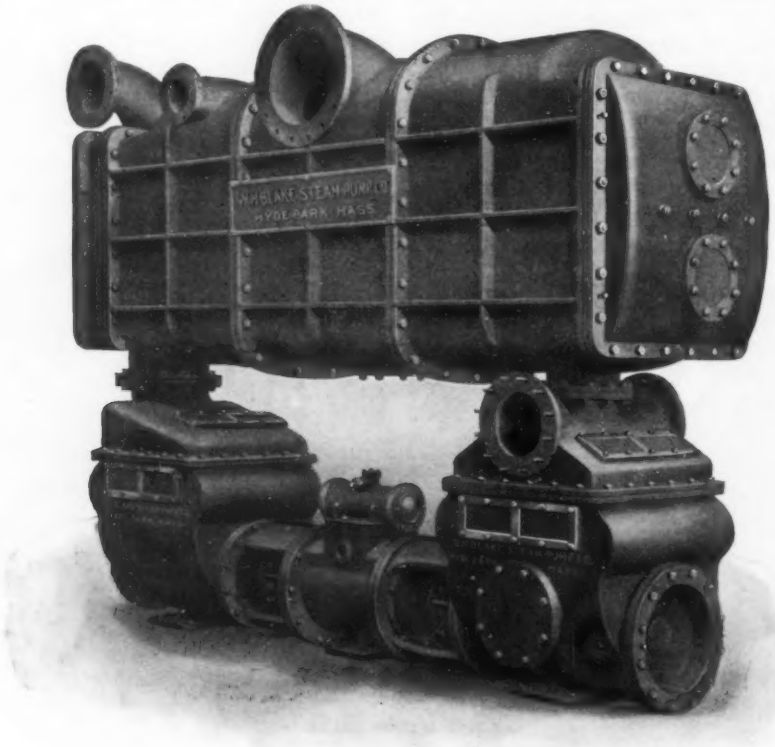
The foundry of the Draper Co., Hopedale, Mass., is equipped with the very best molding machines; in fact, they represent improvements designed in the Draper shops, and incorporated in trade machines through special arrangement. The Draper castings have won praise wherever they have gone, as particular pains is taken in the selection and combination of different grades of iron to secure uniformity, and the very best possible results both in finish and adaptability to tool work. They are as good if not better than any made elsewhere, but the Draper Co. assert they are not good enough.

Following the general American custom, they have built looms for years by assembling

the frame from the foundry castings, without machining either the sides or girts. In order to perfect the loom frame beyond the general practice of loom builders, a full line of modern machine tools has recently been introduced. Every Draper loom now sent out has the sides carefully milled where other parts are attached, and the connecting girts are also milled to absolute uniformity in length. The cut shows one of the loom side milling machines in operation. There are so many places to be cut that a considerable variety of motions is necessary. The machine for milling the girt ends is naturally more simple in detail. The looms now approach a uniform standard of size and position of parts, and it is expected that they will operate with uniformity and precision. Repair parts will naturally fit closer, and the whole machine has been raised into a higher class by starting with a machined frame.

A NEW TYPE OF THE W. H. BLAKE CONDENSER.

A feature of the old time compound engine was the somewhat cumbersome direct connected air pump. In modern practice this device, in connection with an independent condenser, is designed to be placed at any convenient point and to operate at any speed independently of the main engine. Choice may be readily made between the surface or jet type of condenser, largely dependent upon whether the condensed steam is to be returned direct to the boiler or not.



THE NEW W. H. BLAKE CONDENSER.

A complete line of independent jet and surface condensers has just been perfected by the W. H. Blake Steam Pump Co., Hyde Park, Mass. These range in capacity from 600 to 40,000 pounds of steam condensed per hour with injection water of 70 deg. F. The accompanying illustration is representative

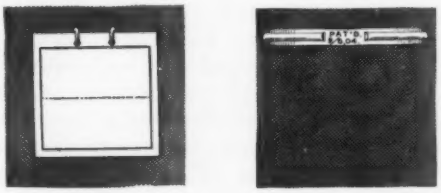
of its class, the dimensions being as follows: Steam cylinder, 18 in.; air cylinder, 20 in.; circulating cylinder, 20 in.; stroke, 18 in.; condensing surface, 2,000 sq. ft.; steam condensed per hour with injection water at 70 deg. F., 40,000 pounds; suction and discharge pipes for air cylinder, 14 in. and 12 in.; same for circulating cylinder, each 14 in.

This is of the surface condenser type, designed along the best lines of marine practice and capable of withstanding the hardest usage. The tubes are of Muntz metal, so held in the tube sheets as to allow for free expansion. The steam passes in at the top and thence across the water tubes and finally escapes below as water of condensation. Rapid condensation is secured by the introduction of baffle plates, which force the steam into close contact with the exterior of all the pipes through which the water flows. The condenser shell, rectangular in cross section, is supported by the combined air and circulating pump, which is of exceptionally substantial construction. Absolute certainty of action is ensured, for the valve mechanism is actuated solely by direct boiler pressure, and is not dependent upon an adjustable arrangement of levers and rods connected to the piston. With the latter arrangement, which is not employed upon the pumps, there are certain points in the stroke where the valves are not directly controlled, but momentum is relied upon to reverse the valve gear. These pumps are composition fitted throughout, both the water and air cylinders are lined, and a Tobin bronze piston rod is used.

A PROTECTOR FOR PIN TICKETS.

Everyone whose fingers have been lacerated by pin tickets—and whose have not?—will be interested in the clever little device manufactured by the Niagara Clip Co., 38 Park St., New York City, which is known as the "Niagara Pin-Kap." The Niagara Clip Company were the originators of the Niagara clip which is so widely used in every business office and this new device for protecting all makes of pin tickets will be welcomed. The illustrations show clearly what the device is and how it is applied. Any boy or girl can use it as well as a more experienced person. The clip is held as shown and the prongs of the pin ticket inserted in the cap, which is then flattened out and the sharp points securely fastened and covered. Pin tickets have such a wide use that this device for

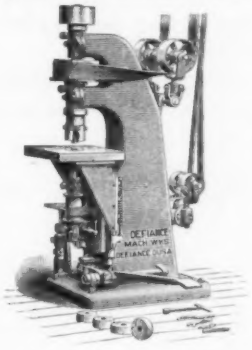
making them harmless to the fingers and preventing mutilation of other goods and samples will be appreciated. It is one of those devices which recommends itself at a glance



and the price, 45 cents per thousand, is so low as to bring them within the reach of everyone who has occasion to use pin tickets.

SPOOL AND BOBBIN MACHINERY.

The accompanying illustration shows a spool and bobbin disk cutting and boring machine built by the Defiance Machine Works, Defiance, Ohio, who make a full line of machinery for the manufacture of all kinds



of spools and bobbins. Their machinery is all of the latest design and fitted with the most approved labor-saving devices, the builders claiming that 25 per cent. can be saved in the manufacture of spools and bobbins as compared with the old methods. The disk cutter and boring machine is used for

cutting round wooden disks from a plank and boring a hole in the centre. These disks are used for making spool and bobbin heads and flanges. It will accommodate a thickness of 2 1/2 inches and a diameter of 14 inches, or less. When making these disks without being bored the boring attachment can be quickly disengaged. The frame is a heavy casting of modern design with cored centre, and a wide floor base to give a firm support.

The cutterhead spindle, of steel, large in diameter, is fitted into heavy self-lubricating bearings. The cutterhead used is of special design, it requiring a head for each diameter of disc to be cut, and so fitted to the spindle that it can be quickly placed on or off.

The table supporting the work, with the boring attachment fitted to it, is provided with a vertical movement by foot treadle to bring the work up to the cutterhead, the operator having both hands free to handle his work, enabling him to cut the discs from the plank to the best advantage, without the loss of stock, and produce about 5,000 medium-sized discs in ten hours, and other sizes in proportion. The shaping and boring of this work are both performed at the same time.

This machine is so constructed that the discs cannot foul and get fast in the cutterhead. They are firmly held against the table by a plunger until the cutterhead is free from the work, when they are released. The cutting and boring are performed clean and smooth and very rapidly by unskilled labor.

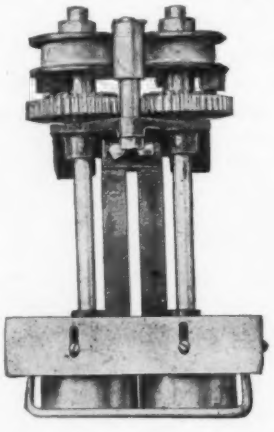
Further information can be obtained from the builders who manufacture all kinds of wood-working machinery.

THE KERSHAW WEB FEED AND GEARED TRAVELER.

The American Drying Machinery Co., 19th and Westmoreland streets, Philadelphia, Pa., have taken over the manufacture of the Kershaw feed.

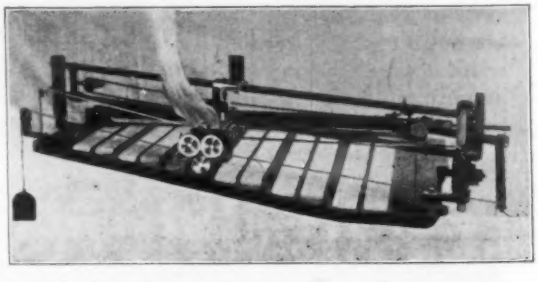
The principle upon which this web feed works is as follows: The stock from the breaker card is doffed on a 4 1/2-inch apron and carried to the side draw rolls in a web form about six inches wide, then carried overhead and laid on the table with one layer lapping over another in a thoroughly loose condition, and not rolled or twisted by a tube. The lumping-in over the leader-in is obviated on account of the very loose condition of the stock being fed to the card.

It is claimed that the side ends can be run



much lighter with web feeding than with the round sliver, from the fact that the imperfections of the side machine are much less uneven. Some mills run without making side ends, as a preference, although that is not recommended.

It is further claimed that with this style of web feeding a much lower stock can be



worked, and that the trouble and annoyance of the turn or knuckle on the sides of the machine is overcome.

The geared traveler is simple and durable in construction, having the gears above the travis board and convenient to get at. The head is traversed by chain driver and the rolls driven by a stationary belt, assuring a compact, even feed across the entire machine at all times. No gears are required for changing the speed of rolls.

The traveler, as well as the web feed, is applicable to other diagonal feeds.

Dyeing, Bleaching, Printing, Etc.

ANILINE BLACK ON COTTON.

The production of desirable shades of black upon cotton is a matter of great interest to the dyer, and as is well known there are a number of processes by the use of which blacks of almost any tone or shade may be obtained, each, however, having certain possibilities and limitations.

The standard type of black at this time is without doubt that obtained from aniline oil or salt, being the so-called "oxidized black"; and which has caused many imitations to appear from time to time, but without any marked success, except perhaps the blacks belonging to the sulphur group.

Many attempts have been made and are still being made to obtain blacks that can be applied by the direct dyeing process, but except so far as shade is concerned it is feared that the properties of the blacks thus dyed will not bear comparison to those obtained from either aniline oil or the sulphur colors. In this connection it may be interesting to note a few of the particulars concerning aniline black. In the first place it may be noted that the composition of the black itself is not definitely known. It is the fastest black known and when well dyed resists equally exposure, air, light, washing and soaping. The disadvantages—such as they are—are to be attributed to defects of the dyeing operation, and a tendency to a weakening of the cotton, and a greening of the shade, but notwithstanding this, it is perhaps the most widely used of all practical, technical blacks, and mainly on account of low cost.

There are several processes for producing this black of which the following may be regarded as the most important. For 100 lbs. cotton, use 11 lbs. aniline oil, 40 lbs. muriatic acid, and 160 gals. water. The dye bath being filled with water, the oil and acid are added, after which 15 lbs. bichromate of soda is added, previously dissolved in water. Now add the cotton, work first in the cold, and gradually raise the temperature to the boil.

Another method, which when properly worked yields a black that is ungreenable and will not rub or crock: 35 lbs. aniline salt, 100 lbs. aniline oil, 20 gallons water, 10 lbs. sal ammoniac, 10 lbs. bluestone, 10 lbs. chlorate of soda. The chlorate and sal ammoniac are dissolved in 6 1/2 gallons water, and the bluestone in 5 1/2 gallons water. The aniline salt is dissolved in the smallest possible quantity of hot water, to which is added sufficient aniline oil to neutralize any free acid. This solution is added to the dye bath with the chlorate of soda and sal ammoniac solution, and finally the bluestone, the whole being diluted to 140 deg. Tw., the bath being now ready for dyeing. From this bath the goods are taken and run through a solution containing 10 lbs. bichromate of potash and 5 lbs. of soda for each 100 gallons of water at 160 deg. F., after which they are thoroughly washed and subjected to the action of dry steam at a pressure of about 15 pounds.

It is impossible to dye aniline black satisfactorily without a general knowledge of dyeing on the one hand, and considerable experience with aniline on the other.

Aniline black dyeing as such, is a specialty, and as a rule dyers who are experienced in the process rarely attempt other work.

THE SULPHUR BLACKS.

A close second to the aniline blacks are those belonging to the sulphur group. During the past few years this particular group of dyes has made many advances, and their processes today for their application to textiles are remarkable for their simplicity in comparison to what they were a few years ago. Formerly the dyer was confused by details of processes requiring great accuracy between this and that ingredient, and always in fear that disastrous results would ensue, if the slightest scum or sediment was noticed, and the instructions regarding the proper balance maintained between sodium sulphide and common salt were sufficient to cause him to be discouraged at the outset of his trials.

Happily today all this is over. Where formerly the sulphur dyes were not easily dissolved and special precaution had to be taken to ensure them remaining in solution, now it is simply a matter of dissolving at once the required amount of dyestuff, adding a few pounds of common salt and a few ounces of soda. The dyeing operation resolves itself into simply entering the wetted-out yarn or piece-goods, bringing to the boil, and occasionally turning until a satisfactory deep shade is obtained.

When properly dyed, the sulphur blacks yield handsome and brilliant shades, and they resist almost every influence to which textiles are likely to be subjected.

For hosiery, these blacks are particularly adapted, for nowhere in the dyeing process is anything used that is even slightly destructive to cotton. The resulting shades when properly finished are quite equal to aniline black. The only objection that can be raised against them is that, in time, they become slightly greyish, but by the time this grey tone is observed, the stockings are ready to be discarded.

Chemically, the sulphur blacks resist almost everything that the aniline blacks do, with the exception of chlorine, but of course this would never be applied unless in the form of a very weak solution of bleaching powder, so that on this count the two groups of black are nearly equal.

The cost of dyeing the sulphur blacks has not yet been reduced to such a point that they can compete pound for pound of dyed goods of equal shade with aniline, but when it is considered that there are no losses due to tendered goods, and that the cost of installation for a given output is less for sulphur colors than for aniline, the advantages of the former become at once apparent.

THE DIAZOTIZED BLACKS.

This group of colors reached perfection before the sulphur colors were proven practical. Their method of application is easy, requiring no difficult precautions, but for a given output they require a correspondingly larger plant than for the sulphur colors. The diazotized blacks are dyed only upon cotton in exactly the same manner as the well-known primuline.

The selected black for the first kettle is dyed with about 7 pounds of dyestuff and 30 to 40 pounds of salt for 100 pounds of cotton yarn, dyeing progressing for from 3/4 to 1 hour at the boil, the goods lifted and rinsed and then passed through a second bath containing nitrite of soda and muriatic acid in the cold, afterwards rinse, and the color developed and fixed in a bath containing beta naphthol or metatoluylene diamine, or one of the other appropriate black developers.

This method of dyeing blacks upon cotton requires two intermediate washings, while the nitrite bath must be renewed each time, consequently a rather large water supply is demanded.

The number of blacks on the market and available for this process are many if we judge by the names given them, but as a matter of fact we incline to the belief that the majority of them are only mixtures of a few types that are really the foundation colors of the entire group of such blacks.

The properties of this group of blacks are such that they can be made great use of for many classes of textile manufactures. By far the largest outlet being in the production of cotton and wool mixtures, where the cotton and the wool are dyed separately for the purpose of producing figured effects.

These blacks stand washing and soaping very well, but appear to lose their brilliancy upon long exposure to light.

DIRECT BLACKS.

This group of blacks is so well known as to require but a brief mention. They meet many requirements and fill demands where preceding blacks possess no advantage.

One important feature regarding these blacks is the possibility of fixing them upon cotton by means of an aftertreatment with formaldehyde, a process that is now quite common, the change effected being such that the resulting color is so fast to soap and water as not to stain adjacent white material when milled with it.

As a rule, direct blacks are not fast to prolonged washing or strong soaping, and under no circumstances can they be regarded as competing in any way with the blacks that have been previously described.

BASIC BLACKS.

Attempts have been made from time to time to produce a black that can be dyed upon a sumac and antimony bottom by suitable mixtures of basic reds, blues and greens, or of red, blue and yellow, but in no instance with success. Such a black, even if it is produced will have no advantage comparable to any of the well known types of blacks that find favor at the present time.

DISCOLORATIONS IN BLEACHED GOODS.

These defects are of such frequency, and the causes that are responsible are so imperfectly known that a correct solution of the difficulty seems remote. It is known, however, that bleached goods very frequently change color,—take on a brownish tint—and otherwise lose in value upon storage. This alteration has been credited to a number of influences, the most important being iron which is almost always a normal constituent of a number of sources of water and which cannot be successfully removed unless a special process of purification is installed.

Another source of trouble that may be regarded as a possible agent is magnesia in the water, and which has been brought to recent attention by Mr. S. R. Trotman of England. Of course, magnesia alone will not cause discoloration of the fabrics, but in combination with the rosin of the ordinary soaps used in bleaching, magnesia-rosin soaps are found which are quite insoluble, and become attached to the cloth and cannot be removed by any washing process, so that every precaution should be taken that only pure water, or at least water free from lime and magnesia is used.

The purer the water used in bleaching, the cleaner will be the finally finished fabrics, and to this end, where space permits, or the amount of bleaching done warrants, a water plant should be put in operation. Where this is not possible, recourse should be had to the use of chemicals that will retard the formation of these magnesia rosin salts.

Borax has been found to be of great value; goods that have been bleached with the aid of this substance have retained their brilliancy for very long times, and when known to have been bleached with water containing notable quantities of alkaline earth. Objections have been raised to the use of borax on account of its cost, but it is believed that an equivalent value of soap may be displaced and borax substituted, so that while less soap (and consequently less rosin) is used, the cost remains the same, the only advantage being the freedom from discoloration, but this is a very desirable advantage.

The removal of the lime and magnesia from water is best done by means of slight additions of milk of lime and caustic soda. This addition is regulated by the amount of impurities contained, the only essentials being that the impurities in the form of a fine precipitate have time to subside. This is best done by means of proper subsiding tanks specially designed and constructed for this purpose. The essential feature of this system of technical water purification is that it is continuous; the volume of outflow being regulated by the amount of impurities.

The chemical reaction that takes place is such that the water is completely freed from all impurities, the only matters present being slight trace of soluble alkali.

Another process that is considerably used is based upon the use of phosphate of soda, which acts at once on the alkaline earths (lime and magnesia) and iron, so that the water is specially valuable for bleaching purposes.

In case alum is the purifying agent, water of absolute clearness is obtained and free from nearly all impurities that are likely to injure bleached goods.

The choice of a soap for bleaching purposes is not so much a matter of importance as is usually supposed. Any good grade of tallow soap will meet all requirements, but it has been found that the presence of rosin has a very marked action upon the natural oily and waxy matters always found on cotton, and which have never been successfully removed except with rosin soap, or a soap containing a fair percentage of this substance. It has been supposed that rosin is an adulterant of soap, but where it is used for this purpose, and its presence is thoroughly understood by the purchaser, no ob-

jections can be made. On the other hand, a pure rosin soap can be used in connection with a pure tallow soap, thus enabling the bleacher to regulate the action of the soap by varying the proportions to suit.

Where pure water is at hand, free from lime or magnesia, and a pure soap even with rosin, no after effects need be feared.

Of course, blemishes in bleached cotton goods may be due to a variety of other causes, the most prominent being mildew, and other influences directly traceable to the starch sizing and the antiseptics used in the finish. These should be selected in such a manner as to guard against impurities due to the process of manufacture of each substance used.

Washing of bleached goods should be so thoroughly done with pure water that all soluble impurities in the cloth are removed, and only a clean fabric goes to the finisher. In this connection, it may be well to remark that the best results are always assured when washing is done with warm water, but as this entails a slightly increased cost it is seldom resorted to.

Soft water is essential in all textile operations, and the safest course to adopt in any mill is to make proper provision so that in every operation where water is used, no chance need be assumed as to the possibility of lime or magnesia salts being present, aside from the possible injury to the finished goods, there is a very large waste of soap which can otherwise be saved if pure water is used. If very limy water is used, the value of the soap saved due to pure water will in many instances materially reduce the cost of bleaching.

Frequently, discolorations may be traced to the excessive use of too strong bleaching lime solutions, which always contain traces of iron difficult of removal, and which under the circumstances lead to the production of oxycellulose, a change in the cotton very liable to turn brown or creamy in time.

The composition of the finish used on the goods must also be kept in mind, when ultramarine is used, and traces of acid exist, a slow decomposition sets in which in time destroys the small amount of ultramarine present, and consequent clouding of the pure white.

Summing up the causes, we find that the water used should be free from any suspended matter, clay or silt; free from lime, magnesia, and iron; that the soap used be pure and easily dissolved. That the washing of the boiled out goods be so thorough that no soap remains in the goods when they pass into the bleaching tanks. The washings at every part of the process should be with ample water, and at the right temperature. Finally, the finish should be of such composition that it will remain on the goods as put on, and not suffer any change, even under varying conditions.

WATERPROOFING OF WOOLEN CLOTH.

It is doubtful if the ideal waterproofed woolen fabric has yet been perfected and put upon the market. Although there are a number of fabrics that cannot be wetted, yet they possess some qualities that are not to be desired. A waterproof fabric is one that has been so treated that water will not penetrate through it, but it is needless to observe that such a fabric would be unduly heavy. On the other hand a fabric that would be woven so close as to prevent rain from going through it, would also be, when waterproofed, unpleasant to wear on account of the absence of ventilation.

Perfect waterproofing has for its object not the closing of the pores or meshes of the cloth, but rather the coating, or more correctly the impregnation of the threads and fibres with some substance that cannot mix with water or be dissolved by it.

Many processes have been brought forward during the past few years for waterproofing woolens, but the following may be regarded as those most likely to yield the best results:

PROCESS I.

Take a large cask, and pour into it 50 gallons of water and then add 30 pounds of alum, and after this is dissolved, add 30 pounds of sugar of lead. Steam is then blown in through the water until no lumps remain. Shut off the steam, and let the white sediment subside, after which draw off the clear solution of acetate of alumina for use.

The goods are soaked in this for about two

hours, when they are removed, rinsed well, hydroextracted, and thoroughly dried.

PROCESS II.

Fifty pounds of potash alum are dissolved in 500 gals. of water. Fifty pounds of glue are soaked in 10 gals. cold water. When the glue has soaked over night, heat to boiling, and when solution is complete, stir in 2 1/2 pounds tannic acid and 1 lb. silicate of soda and afterwards add it to the alum solution. Stir well until the mixture is complete, and allow to cool to about 170 deg. F., and pass the goods through until they have become thoroughly saturated, after which they are well squeezed and dried.

This process is a good one, and while the formula is quite simple and easily compounded, yields results that are of good value.

PROCESS III.

A simple process for fabrics that are intended strictly for raincoats or umbrellas involves the use of volatile solvents such as common benzine. The details are as follows, but they must be modified according to the nature of the cloth to be treated, its weight and its ultimate use:

Take a pound of pure paraffin and melt it. When it is fluid, add to it 1/4 lb. of best scrap rubber—not vulcanized—and continue the heating until all is dissolved, then let it become solid and cut it up into blocks for use.

To waterproof, calculate the amount of benzine necessary thoroughly to wet the cloth to be treated, and to every gallon dissolve 1 to 1 1/2 ounces of the rubber-paraffin mixture. After thoroughly wetting the cloth in this solution allow the benzine to evaporate, and the cloth will remain thoroughly "proofed." An ironing over heated cans greatly improves the work besides driving off any remaining odors due to the benzine.

Coir fibre is obtained from the fibrous shell of the cocoanut and is said to be superior to all other fibres for cable making on account of its lightness and great elasticity.

The jute fibre was introduced into Scotland in 1830 and since that time the development of jute weaving in that country has been rapid.

AFFINITY OF DYES FOR STARCH.

Some experiments bearing on the affinity of dyes for starch and mineral bodies are published in the "Monatshefte fur Chemie." Starch was shaken up with cold aqueous solutions of coal-tar colors, and repeatedly washed with water until no more dye could be rinsed out. Picric acid, Fuchsine S, and acid dyes in general only colored the starch feebly. Hessian yellow and Alkali Blue showed a greater affinity, while basic dyes, such as Fuchsine and Methylene Blue, dyed the starch with a strong tint fast to water. The affinity of the dyes for starch seems to be inversely proportional to the number of sulphoxyl groups they contain. One exception, however, is Diamine Blue BB, which, unlike other benzidine-azo dyes, colors the starch strongly. The color is removed from the starch slowly by alcohol, quickly by acetone or dilute hydrochloric acid.

If an aqueous solution of a basic dye is stirred up with a sufficient quantity of potato starch, the latter absorbs the whole of the coloring matter, leaving the solution perfectly colorless, and behaves to them exactly like animal fibre or mercerized cotton. When an aqueous solution of a basic dye is treated as above described with finely powdered sulphur, calcium sulphate, strontium sulphate, barium sulphate, calcium carbonate, barium carbonate, magnesium carbonate, manganese carbonate, lead carbonate, alumina, aluminium phosphate kaolin, talc, pumice, zinc oxide, or kieselguhr, the pumice and the talc become dyed fast to water. The results are exactly the same whether the dye solution is hot or cold.—Dyer and Calico Printer.

FAST CHROME VIOLET B W.

In the May number of the Textile World Record and Dyers' Supplement a sample of Fast Chrome Violet B W (C. Bischoff & Co.) was shown. Through an inadvertence on the part of the dyer the dyeing directions were not followed, with the result that the shade was wrong. We have redyed this sample and it will be shown in our July issue.

DYE RECIPES.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation Subscription price for the Dyers' Supplement $1.00 per year

Recipe No. 81.

Black on Worsted Yarn.

Acid Alizarine Black 4 S on 100 lbs. worsted yarn. Prepare the dye bath with

6 lbs. Acid Alizarine Black 4 S.
(Walter F. Sykes & Co., 85 Water St., New York.)
15 lbs. Glauber's Salt.
5 lbs. Sulphuric Acid.

Enter yarn at 180° F. and dye at a boil for one hour.

Acid Alizarine Black 4 S gives a full, jet-black shade that is especially fast to fulling and scouring without the necessity of after chroming.

Recipe No. 82.

Blue on Worsted Yarn.

Wool Fast Blue B L on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Wool Fast Blue B L.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
10 lbs. Glauber's Salt.
3 lbs. Acetic Acid.

Enter at 140° F., bring slowly to the boil and dye at a boiling temperature for ½ hour, then add

3 lbs. Sulphuric Acid

and boil for another half hour.

Wool Fast Blue B L possesses excellent fastness to light, and its fastness to washing, alkalies, acids, carbonization, stoving, steaming and ironing is very good.

It leaves cotton checking threads in woolen pieces quite white.

Recipe No. 83.

Fawn Color on Cotton Yarn.

Crumpsall Brown O on 100 lbs. cotton yarn. Prepare the dye bath with

¼ lb. Crumpsall Brown O.
(Thos. Leyland & Co., 53 India St., Boston.)
5 lbs. Glauber's Salt.

and dye at a boil for one hour.

Crumpsall Brown O is one of the fastest direct cotton colors to light and washing and is valuable in the production of tan, fawn and khaki shades. It is a good color for slop padding and discharges well with tin crystals and zinc.

Recipe No. 84.

Black on Cotton Yarn.

Para Diamine Black B on 100 lbs. cotton yarn. Prepare the dye bath with

6 lbs. Para Diamine Black B.
(Cassella Color Co., 182 Front St., New York.)
1 lb. Soda Ash.
30 lbs. Common Salt.

Enter the yarn at 180° F. and dye at a boil for one hour.

Para Diamine Black B possesses good fastness to washing and withstands particularly well the lustring and finishing processes applied to cotton linings and polished yarns.

Recipe No. 85.

Red on Worsted Yarn.

Sulphon Red S R on 100 lbs. worsted yarn. Prepare the dye bath with

2½ lbs. Sulphon Red S R.
(Walter F. Sykes & Co., 85 Water St., New York.)
15 lbs. Glauber's Salt.
5 lbs. Sulphuric Acid.

Enter yarn at 180° F. and dye at a boil for one hour.

Sulphon Red S R is a new fast red, and is much superior to the older Rocelline reds in brilliancy and solubility. It stands light well, dyes evenly and penetrates well, making it especially desirable for wool and piece goods and heavy felts.

Recipe No. 86.

Slate on Worsted Yarn.

Domingo Alizarine Blue G on 100 lbs. worsted yarn. Prepare the dye bath with

1 lb. Domingo Alizarine Blue G.
(C. Bischoff & Co., 88 Park Pl., New York.)
15 lbs. Glauber's Salt.
2 lbs. Sulphuric Acid.

Enter at 160° F., dye at a boil one hour, and then add to the dye bath

2 lbs. Potassium Bichromate

and after treat in this ½ hour at a boil.

Domingo Alizarine Blue G is well adapted to the dyeing of compound mode shades, slates and drabs. It possesses remarkable fastness to the common color-destroying agencies.

Recipe No. 87.

Black on Cotton Yarn.

Oxydiaminogene F F on 100 lbs. cotton yarn. Prepare the dye bath with

6 lbs. Oxydiaminogene F F. (First bath.)
(Cassella Color Co., 182 Front St., New York.)
1 lb. Soda Ash.
30 lbs. Glauber's Salt.

Dye at a boil for one hour, then diazotize for 20 minutes in a cold bath containing

2½ lbs. Sodium Nitrite.
7½ lbs. Concentrated Commercial Hydrochloric Acid.

Rinse and then develop in a cold bath containing

1 lb. Phenylene Diamine

dissolved with about ⅓ its weight of soda ash, working twenty minutes and then wash.

Oxydiaminogene F F is excellently suited for the dyeing of loose cotton, yarn and piece goods, and also for mercerized materials, their property of withstanding pressing and finishing without altering their shade being of great value when applied to piece goods.

Recipe No. 88.

Blue on Worsted Yarn.

Compound Shade on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Indocyanine B.
1 lb. Chrome Fast Black F.
(Berlin Aniline Works, 215 Water St., New York.)
10 lbs. Glauber's Salt.
3 lbs. Acetic Acid.

Enter at about 120° F., raise slowly to the boil and dye at boil for ¾ of an hour, then add

¾ lb. Sulphuric Acid,

and boil 15 minutes longer.

When the bath is exhausted add

1 lb. Potassium Bichromate.
¾ lb. Sulphuric Acid,

and continue dyeing one-half hour at the boil.

This combination is particularly well suited to the dyeing of loose wool, and gives shades possessing excellent fastness to the common color-destroying agents.

Recipe No. 89.

Black on Worsted Yarn.

Chrome Fast Black F on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Chrome Fast Black F.
(Berlin Aniline Works, 215 Water St., New York.)
10 lbs. Glauber's Salt.
3 lbs. Acetic Acid.

Enter at 120° F., raise slowly to the boil and boil ¾ of an hour, then add

¾ lb. Sulphuric Acid

and boil fifteen minutes longer.

When the bath is exhausted add

1 lb. Potassium Bichromate,
¾ lb. Sulphuric Acid,

and continue dyeing one-half hour at the boil.

Chrome Fast Black F is particularly well suited to the dyeing of loose wool, and gives shades possessing excellent fastness to the common color-destroying agents.

Recipe No. 90.

Blue on Worsted Yarn.

Criterion Blue G on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Criterion Blue G.
(F. E. Atteaux & Co., 174 Purchase St., Boston.)
4 lbs. Acetic Acid.
10 lbs. Glauber's Salt.

Enter the yarn at 120° F., bring slowly to the boil and dye at a boiling temperature for ¾ of an hour.

Then add

1 lb. Sulphuric Acid,

and boil 15 minutes longer. Then add

1 lb. Potassium Bichromate

and boil 30 minutes longer.

Criterion Blue G possesses excellent fastness to the common color-destroying agents.

Recipe No. 91.

Blue on Worsted Yarn.

Chromotrope D W on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Chromotrope D W.
(H. A. Metz & Co., 122 Hudson St., New York.)
15 lbs. Glauber's Salt.
3 lbs. Sulphuric Acid (5 lbs. with very hard water).

Enter yarn at 100° F., bring slowly to the boil and dye at a boil for one to one and one-half hours. The dye bath is then cooled and

3 lbs. Potassium Bichromate added.

The dye bath is again brought to the boil and the shade develops in from one-half to one hour.

Chromotrope D W penetrates well and possesses

excellent equalizing properties, and is therefore suited for the dyeing of loose wool, yarn and piece goods in open kettles and dyeing apparatus. The shades produced with this dyestuff possess excellent fastness to all the common color-destroying agents.

Recipe No. 92.

Green on Cotton Yarn.

Katigen Green 2 B X on 100 lbs. cotton yarn. Prepare the dye bath with

15 lbs. Katigen Green 2 B X. (9)
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
15 lbs. Sulphide of Soda Crystals. (9)
6 lbs. Soda Ash. (2)
30 lbs. Common Salt. (5)

The figures in parentheses refer to standing baths.

Enter yarn at the boil and dye at a boil for one hour.

Katigen Green 2 B X produces a brighter and yellower green than most of the sulphur greens. Its fastness to light is good but its fastness to light and boiling is not quite as good as some of the other Katigen Greens.

Recipe No. 93.

Brown on Cotton Yarn.

Tetrazo Sulphur Brown C R Extra on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Tetrazo Sulphur Brown C R Extra.
(American Dyewood Co., 156 William St., New York.)
15 lbs. Sodium Sulphide (Concentrated).
3 lbs. Sal Soda.
75 lbs. Common Salt.

Dissolve the color separately with the sodium sulphide and then add to the dye bath containing the sal soda and boil for a few minutes to ensure complete solution of color. Then add common salt and boil up again.

Dye the yarn just below the boil for one hour.

Tetrazo Sulphur Brown C R Extra gives a useful shade of brown, which is fast to washing, fulling and cross-dyeing.

Recipe No. 94.

Black on Cotton Yarn.

Oxydiaminogene F F G on 100 lbs. cotton yarn. Prepare the dye bath with

6 lbs. Oxydiaminogene F F G. (First bath.)
(Cassella Color Co., 182 Front St., New York.)
1 lb. Soda Ash.
30 lbs. Glauber's Salt.

Dye at a boil for one hour, then diazotize for 20 minutes in a cold bath containing

2½ lbs. Sodium Nitrate.
7½ lbs. Concentrated Commercial Hydrochloric Acid.

Rinse and then develop in a cold bath containing

1 lb. Phenylene Diamine,

dissolved in ⅓ its weight of soda ash, working 20 minutes, then wash.

Oxydiaminogene F F G is excellently suited for the dyeing of loose cotton yarn and piece goods and also for mercerized materials, their property of withstanding pressing and finishing without altering the shade being of great value when applied to piece goods.

Recipe No. 95.

Blue on Cotton Yarn.

Tetrazo Sulphur Blue P (Conc.) on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Tetrazo Sulphur Blue P (Conc.)
(American Dyewood Co., 156 William St., New York.)
8 lbs. Sodium Sulphide (Conc.)
3 lbs. Sal Soda.
75 lbs. Common Salt.

Dissolve the color separately with the sodium sulphide and then add to the dye bath containing the sal soda, and boil for a few minutes to insure complete solution. Then add the common salt and boil up again.

Dye the yarn just below the boil for one hour, keeping below the surface.

Tetrazo Sulphur Blue P (Conc.) gives an excellent shade of blue, and possesses excellent fastness to washing, fulling and cross-dyeing.

Recipe No. 96.

Black on Cotton Yarn.

Katigen Brilliant Black B Extra on 100 lbs. cotton yarn. Prepare the dye bath with

16 lbs. Katigen Brilliant Black B Extra. (9.5)
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
32 lbs. Sodium Sulphide Crystals. (19)
8 lbs. Soda Ash. (2)
50 lbs. Common Salt. (5)

Numbers in parentheses refer to standing baths.

Enter at a boil and dye one hour in a gradually cooling bath. Rinse as quickly as possible, wring and dry.

Katigen Brilliant Black B Extra gives a bright bluish black with a greenish blue tone over hand. It possesses good fastness and is very valuable for combination with other Katigen blacks.

Mill News.

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires, facts and gossip of the trade are referred to the Textile Advance News, issued weekly by the publishers of the Textile World Record, at $15.00 per year.

COTTON.

New Mills.

*Connecticut, Norwich. Frank Ufford, reported under Greenville, is now operating a small plant on "Swiss" sponge cloths, toweling, bath towels, wash cloths, machinery wiping waste, etc.

*Georgia, Acworth. It is expected that work will start about June on erection of the new building for the Acworth Cotton Mfg. Co., recently reported incorporated with capital stock of $50,000. Orlando Awtrey is president of the company and J. J. Northcutt, treasurer. They propose making hosiery yarns, average 16, and operating 5,000 spindles.

*Georgia, Athens. We have been advised by R. L. Moss & Co. that they have under consideration the installation of a plant for manufacturing braided cord, especially sash cord, estimating on a production of 1,500 to 2,000 lbs. per day. No machinery has yet been purchased nor organization completed.

*Georgia, Villa Rica. At meeting held recently by the stockholders of the Villa Golden City Cotton Mills, the directors and officers were elected. J. W. Green was elected president of the company; J. E. Hixon, vice president and W. C. Pope, secretary. The new mill will be equipped with 5,000 spindles and 160 looms.

*Mississippi, Meridian. The Beatrice Cotton Mills are making preparations to start work on their new plant. They have not yet engaged an engineer, but are inviting proposals on the machinery.

*North Carolina, Bessemer City. The Vermont Mills, recently reported incorporated, with capital stock of $50,000, will start operations about September 1st, making drills, with equipment of 3,080 ring spindles and 96 looms. D. A. Garrison is president of the company, S. J. Durham, treasurer, and E. A. Tucker, superintendent.

*North Carolina, Concord. C. W. Johnson has been elected president of the Brown Manufacturing Co., recently reported organized; R. A. Brown, vice-president; and E. F. White, secretary and treasurer.

*North Carolina, Spray. The German-American Company, previously reported incorporated with capital stock of $500,000, will erect a plant for manufacturing coarse colored cotton cloth, possibly blue denims. About 12,000 spindles and 300 looms will be installed.

Ontario, Stratford. The Stratford Elastic Webbing Co. has been incorporated with capital stock of $10,000 to manufacture elastic webbing, shoe laces, etc. J. D. Monteith and F. B. Deacon are interested.

*South Carolina, Pacolet. The Pacolet Manufacturing Company has let contract to G. H. Cutting & Co., Worcester, for erection of their new mill.

South Carolina, Pacolet. It is reported that the Pacolet Manufacturing Co. is to build another mill, with equipment of 25,000 spindles and 750 looms. Steps will be taken at once to have plans and specifications prepared and construction work started. It is to be known as Mill No. 5.

*South Carolina, Yorkville. It is expected to have the Neely Yarn Mill, which will be equipped with 3,500 spindles, in operation by September 1st. Electricity will be the motive power.

Enlargements and Improvements.

Alabama, Eufaula. The Chewalla Cotton Mills will instal additional machinery in the plant.

Connecticut, Unionville. The cotton batting department of J. Broadbent & Sons' mills has been closed to make repairs and put in new floors.

Connecticut, Willimantic. The Willimantic Cotton Mills Corporation is to change the mill from coarse cotton seedings and curtain cloths, to cotton pongees and other silk filled goods, on which they now have 24 looms running. New floors and windows and electric lights are to be placed in the old mill and a new weave shed, 150 by 150 feet, erected. The changes in the plant will be made gradually so that there will be no interference with daily operations.

*Connecticut, Windsor Locks. The J. R. Montgomery Co. has started operations in their new plant.

Georgia, Augusta. Alterations and additions are being made to the King Manufacturing Company's mill. They have placed order for 1,000 Draper looms to replace Whitin & Lowell makes. They have installed four new slashers, four spoolers and a new bale opener.

Massachusetts, Fall River. A new mill is under construction on Stafford Road and Caroline Street for Hanscom Bros. The building, which will be 100 by 56 feet, two stories, will be equipped with about 400 braiding machines and other machinery for making flat and round braids, banding, etc. It is thought that the new plant will be ready for occupancy about the first of July.

Massachusetts, Lawrence. Plans have been prepared for extensive improvements to be made to the Arlington Mills. A power house, dye house, weave shed and other buildings will be erected.

New Hampshire, Nashua. An extension 115 by 84 feet is to be built to the cloth room of the Nashua Manufacturing Company.

*North Carolina, Bessemer City. We have been advised by J. A. Smith that it is probable that a new building will be erected this summer for finishing product of their mill.

*North Carolina, Charlotte. The Magnolia Mills have not yet fully decided about the addition proposed to the plant.

*North Carolina, Cumberland. The Cumberland Cotton Mills are in the market for machinery equipment for their mill, which they are remodeling and enlarging, also mill supplies. They make cotton warps and put up yarns in skeins, tubes or cones 8s to 16s single and 2-ply. J. Frederick Houston & Co., 704 Provident Building, Philadelphia, are the owners and buyers.

North Carolina, Dallas. A bleachery is to be erected for the Morowebb Cotton Mills. The building will be 50 by 100 feet, and equipped for capacity of 20,000 lbs. daily.

North Carolina, Fayetteville. The Tolar-Hart-Holt Mills Co. are about to install 1,100 additional spindles in the mill.

*North Carolina, Greensboro. In addition to the increase in machinery equipment, the Revolution Cotton Mills will install electrical equipment and have added a boiler to the power plant.

*North Carolina, Hickory. The E. L. Shuford Mfg. Co. will install new cards and speeders (Howard & Bullough), drawing frames (Whitin), 250 looms (part Draper) and humidifiers (Am. Moistening Co.).

North Carolina, King's Mountain. The Lulu Mills have placed order for 3,000 additional spindles to be installed in the plant. This will give them a total of about 10,000 spindles.

North Carolina, Lowell. At a recent meeting of the directors of the Lowell Cotton Mills, an increase of spindles was decided upon. The order for the machinery has been placed with the Howard & Bullough American Machine Co., Pawtucket, R. I.

North Carolina, Lumberton. The Lumberton Cotton Mills have placed contract for a new 6,000 spindle mill. Work will soon start on erection of the new building.

*North Carolina, Spray. The Rhode Island Company, now operating 5,200 ring spindles and 50 looms, making cotton yarns, 20/1 warp and 19/1 skein, also cotton blankets, advises us that they will erect a new weave shed and install additional looms during the summer.

*Pennsylvania, Chester. The Jordan Manufacturing Company has awarded contract for erection of a large addition to the weave shed, in which 350 new looms will be installed.

Pennsylvania, Columbia Heights. An extension will be built to the Colonial Manufacturing Company's plant, to be used as a printing department. They will also put in ten new looms.

Pennsylvania, Philadelphia. The Courtrai Manufacturing Co., 4155 Frankford Avenue, of which K. K. Skeen is the proprietor, which occupies two floors in the front building, one floor in the back building and annex in another part of the town, is very busy twisting and coning cotton, flax or linen yarns. Mr. Skeen is about to place an order for three new coning machines and one tubing machine, which he will place in operation as soon as they are delivered.

*Pennsylvania, Wilkesbarre. The Wyoming Valley Lace Mills, which recently increased the capital stock from $250,000 to $500,000, are erecting new buildings and will equip with lace machinery (ordered from England) for doubling the present output.

Rhode Island, Barrington. The Rhode Island Lace Works contemplate increasing the capacity of the plant.

*Rhode Island, Pawtucket. Plans have been prepared for the erection of a new building for the Royal Weaving Company. This building will be 521 by 128 feet, two stories high. It is expected to have same ready for occupancy by October 1st.

Rhode Island, Quidnick. The Quidnick Mfg. Co. is making extensive alterations to the plant and has placed their orders for additional machinery. They recently installed a large number of revolving flat cards and are now putting in a large number of speeders and spinning frames, which contract has been placed with the Howard & Bullough American Machine Co., Pawtucket, R. I.

South Carolina, Lando. Additional (Crompton & Knowles) looms are being installed in the Manetta Mills.

*South Carolina, Lexington. The additional machinery is being set up in the Lexington Manufacturing Co.'s plant. This was reported in detail in issue of December 2d.

*South Carolina, Rock Hill. The Arcade Cotton Mills have completed the addition to their plant and installation of 6,000 additional spindles.

South Carolina, Rock Hill. The Highland Park Manufacturing Company has recently installed additional machinery in the dyeing department and started up 300 looms. Plant is being changed from steam power to electricity.

*South Carolina, Union. The Aetna Cotton Mills will be greatly enlarged. An addition, 100 by 200 feet, will be built and the machinery increased from 10,752 spindles and 350 looms, to 30,000 spindles and 750 looms. All of the additional machinery will not be installed at first, but gradually. Print cloths will be made.

Tennessee, Covington. Contract has been awarded by the Tipton Cotton Mills for installation of additional machinery.

Mills Starting Up.

North Carolina, Wilmington. Operations have been resumed in the Wilmington Cotton Mills, with R. L. Thomas, superintendent.

*South Carolina, Lolo. The Valley Falls Mills, which have been closed for the past six months, have resumed operations, making 60/52-6.00 yd. sheeting operating 3,950 ring spindles and 100 looms. W. P. Roof is president of the company, Allen Jones, treasurer, and R. W. Gossett, superintendent.

Tennessee, Nashville. The Tennessee Mfg. Co. will start operations as soon as a sufficient number of operatives can be secured. The plant has been closed for the past year.

WOOLEN.

New Mills.

*Massachusettts, Charlton City. Operations will be resumed about August 1st, by the Aldrich Manufacturing Co., which is rebuilding plant recently destroyed by fire. This company is capitalized with $6,000, Thomas Ashworth, president, and James Ashworth, treasurer. Will make piece dyes, men's goods, operating 2 sets cards and 36 looms. Product will be sold through L. Bachman & Co., New York.

*Massachusetts, Uxbridge. The Stanley Woolen Company has been incorporated with capital stock of $100,000, to operate the Calumet Mill. William E. Hayward is president of the company; Arthur Wheelock, treasurer and Stanley H. Wheelock, secretary. They will manufacture cotton and woolen goods.

Pennsylvania, Chester. The Marion Mills, the new mill recently started up by Murphy & Bro., of Philadelphia, manufacturers of cotton, woolen and worsted goods at 16th and Fitzwater streets, is now in full operation, operating 6 sets 60-inch cards, 3200 spindles, 20 broad looms and 64 narrow looms on cottonades, cotton worsteds and fancy woolens. A. W. Etchells is the superintendent, the goods being sold direct. This plant is located in one of the Esrey mills on Highland Avenue.

Pennsylvania, Philadelphia. The Franklinville Rug Mills is manufacturing Axminster rugs on 50 looms at 4200 North 5th Street, which they are selling through in all the large cities throughout the country. They are very busy.

*Pennsylvania, Philadelphia. Operations have been started by the Shetland Worsted Mills, making men's wear and dress goods, worsted and cotton. Plant is equipped with 16 looms. Goods are sold through Duval, Cone & Terhune, New York. This is a partnership, F. N. Rigg, F. W. Simons and S. D. Worthington, partners.

Enlargements and Improvements.

Connecticut, Central Village. The Plainfield Woolen Co.'s mill at this place has been purchased by Joseph E. Fletcher, who proposes doubling the present equipment of 5 sets and operating same in connection with his other plants.

Connecticut, Putnam. The Bay State Worsted Co., of Worcester, Mass., has leased the Putnam Woolen Company's No. 2 mill, which has been closed of late. They are operating same on fancy worsteds and ladies' dress goods.

*Maine, Camden. The new dye house, under construction for the Knox Woolen Company, will be used largely as a scouring plant. The building will be 84 by 42 feet, two stories. A new boiler house, one story, 42 by 18 feet, will also be built.

Maine, Dexter. The Amos Abbott Co. has installed 5 new Crompton & Knowles looms in the plant.

Maine, Waterville. The Chase Manufacturing Co. is adding a story to its picker house and will equip with carding and spinning machinery, installing one set cards and one mule.

*Maine, Winthrop. The Winthrop Mills Co. will start work shortly on erection of part of the new building, which will be 176 by 58 feet, three stories and basement, brick. They have recently removed to new office building.

Maryland, Oella. A new warehouse, three stories high, is to be built for W. J. Dickey & Sons, replacing the one destroyed by fire. Building will be partly heated by steam.

Massachusetts, Boston. Contract has been let by the Roxbury Carpet Co. for erection of a four-story brick building, 86 by 60 feet. It is expected to have same completed in August.

Massachusetts, Concord Junction. The Concord Mills are reported to instal 60 additional (Crompton & Knowles) looms in the plant and later 40 more will be added.

*Massachusetts, Lawrence. The Arlington Mills now have about 130 looms in operation in the Atherton plant and it is expected will have 300 running before July 1st.

Massachusetts, North Andover. The Sutton Mills have installed fourteen new looms in the mill.

Massachusetts, Oxford. Work has been started on erection of a new dye house, 20 by 30 feet, for the Theyer Woolen Company. A new floor will also be put in the weaving room.

Massachusetts, Palmer. A new dye house is to be built for the Palmer Carpet Mill.

Massachusetts, Rochdale. Comins & Co. have been incorporated with capital stock of $50,000. Business will be continued under old firm name.

*Massachusetts, South Royalston. The Whitney Woolen Co. will not erect a new mill this year but will build an addition to the present plant. The oldest portion of the plant will be raised six feet to bring it on level with rest of plant, two new water wheels put in and some new carding machinery installed.

Michigan, Clinton. An addition is being built to the Clinton Woolen Mills. Two more mules (ordered) will be installed.

New Hampshire, North Salem. The Atlas Worsted Company contemplates manufacturing a heavy grade of cloth for hunting coats, and if so, will necessitate the replacing of their present looms with heavier ones.

New Jersey, Camden. The Camden Wool Stock Company reports that they are about to increase the mechanical capacity of their plant by adding three new pickers and four double sets of cards. Thomas Lee is the president and buyer. They are very busy.

New York, Amsterdam. It is reported that McCleary, Wallin & Crouse are contemplating the erection of a new dye house. This concern manufactures Smyrna rugs, mats and carpets, operating 300 looms.

New York, Amsterdam. Twenty-five new looms are being installed in Shuttleworth Bros. & Co.'s carpet mill.

New York, Candor. The Candor Blanket Company has closed the mill to instal a new engine.

*Oregon, Albany. The Bannockburn Manufacturing Company has decided to rebuild the plant destroyed by fire.

Pennsylvania, Chester. The Chester Worsted Co. is very busy operating 2,550 spindles on worsted yarns, 15 to 40, 1/4 to 1/2 blood (Bradford system). This company has in contemplation the erection of a new two-story addition, 65 by 50 feet, in which they will install new spinning machinery. The company has a capital of $200,000, the officers being Joseph Messick, president; W. Seymour Runk, treasurer, and John W. Turner. The production is sold direct.

Pennsylvania, Philadelphia. Messrs. Jackson & Thompson, wool scourers, carders and combers (commission) who have been operating 4 combs and 4 worsted cards in the Whittington Mill, High Street and Leverington Avenue, Manayunk, have dissolved partnership, Mr. Jackson retiring from the firm. Mr. Thompson has formed a new partnership under the name of McCoy & Thompson. The new firm has purchased a site in Crum Lyne, Delaware County, Pa., on which they will erect a new mill and to which they will remove as soon as the building is completed.

Pennsylvania, Philadelphia. Messrs. Charles Porter & Son, manufacturers of men's wear and fancy worsteds on 350 looms, are about to have erected a new dye house and power house for their mill at Howard and Norris Streets. The contract has been awarded and the work will be commenced at once.

Pennsylvania, Philadelphia. Sub-estimates are being taken by M. Ward Easby, builder, for a new carpet mill to be erected for Joseph Lomax now at 2333 Mascher Streets, manufacturer of ingrains on 30 looms. The new mill will be located at Jasper and Orleans Streets.

Pennsylvania, Reading. Brumbach Bros., proprietors of the Exeter Woolen Mills, are building an additional story to the mill.

Rhode Island, Bridgeton. Four additional looms have been installed in Wm. H. Prendergast's mill.

Rhode Island, Olneyville. It is reported that the American Woolen Company is to erect a new building, 44 by 82 feet, two stories, near the Riverside Mills.

Tennessee, Jefferson. The Jefferson City Woolen Mills are building an addition for purpose of increasing capacity of the plant.

West Virginia, Terra Alta. The Terra Alta Woolen Mills will shortly start work making fine dress goods flannels and expect to increase their capacity shortly.

Wisconsin, Monticello. The Monticello Woolen Mills are to erect a new picker house.

Mills Starting Up.

*Massachusetts, Clinton. Operations will be started about the middle of June by the Earnsdale Worsted Mills, W. V. Brodmerkle, proprietor.

Mills Shutting Down.

Kansas, Topeka. The Topeka Woolen Mill will probably stand idle as the parties having purchased same have decided not to operate it.

For Knitting Mill News, see Knitting Department.

SILK.

New Mills.

*Connecticut, Meriden. The new braid factory started here recently is controlled by L. Adlman. Silk and soutache braids are made and sold direct.

*Connecticut, Norwich. Operations have been started on a small scale by the Norwich Silk Company, of which Geo. A. Smith is manager.

*Georgia, Augusta. The Singleton Silk Manufacturing Company has been formed by George Singleton and Russell Murray of New York, to operate the Isaetta Mills, recently purchased. Plant will be equipped for spinning silk yarns and thread from Chinese raw material. It is expected later to install weaving machinery.

Massachusetts, Hopkinton. R. & H. Simons, of Union Hill, N. J., have purchased the factory vavated by the Fryeburg Arms Co. and will equip same for manufacturing silks. The new plant will be operated under name of the Herminia Silk Co. and will be equipped with about 250 looms.

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New Jersey, Paterson. Howard & Burke have secured quarters in the Hamilton Mill, and will operate a throwing plant. The company is capitalized at $25,000.

Vermont, Derby. The Telford & Chapman Manufacturing Company is to erect a shoddy mill this spring and will operate the same in connection with their present plant.

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Connecticut, Jewett City. An additional story will be built to the main building of the Aspinook Company's bleach and dye house.

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*New York, Whitehall. The Champlain Silk Mills will start operations about September 1st in their new addition, under construction. They will install 6,000 new silk spindles for making spun silk yarns (schappe) all sizes.

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MISCELLANEOUS.

New Mills.

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Pennsylvania, Philadelphia. The old Pilling Street Bleachery on Factory Street, above Adams Avenue, Frankford, recently leased by Davie & Flynn, will be started up again in a few days. Mr. Flynn has now associated with him a Mr. Kelly, Mr. Davie having retired from the business, and will run the bleachery under the name of the Peerless Bleach Works, Flynn & Kelly, proprietors. They have just installed a new water system erecting a tank with a capacity of 15,000 gallons, put in a new engine, two new washers and other machinery making the plant up to date in every way. This concern bleaches cotton, woolen and linen fabrics making a specialty of hosiery and knit goods with a capacity of 3000 lbs. per day. P. F. Flynn is the superintendent and buyer.

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Kentucky, Paducah. It is reported that the Paducah Textile Company proposes enlarging its plant and increasing business.

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FAILURES AND SUSPENSIONS.

New Jersey, Passaic. The Alexander Silk Mills are reported in financial difficulties, and have been placed in the hands of a receiver; viz., Julius Brandes. The liabilities are placed at $100,000, with assets of $70,000. It is expected that a compromise will be speedily effected.

New Jersey, Paterson. A petition in bankruptcy has been filed by Mr. Harrow, of Harrow, Ryder & Co., manufacturers of ribbons, owing to disappearance of Mr. Ryder. The liabilities of the concern are estimated at about $60,000, with $20,000 assets.

FIRES.

California, San Quentin. The jute plant at the San Quentin prison was damaged by fire recently. Loss is placed at about $500.

Georgia, Atlanta. The Atlantic Iron & Wool Extract Co.'s mill was damaged by fire recently. Also the Southern Blanket Co. The loss is placed at $7,500.

Maine, Skowhegan. The American Woolen Company's mill was damaged by fire, which started in the picker room. The loss is estimated at $3,000.

Massachusetts, Boston. The building occupied by the Kingston Knitting Company was damaged by fire, causing loss of about $2,500 on building and stock.

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Connecticut, Derby. The Estate of Chas. B. Alling has discontinued the underwear department. The entire facilities of the plant will be devoted to manufacture of hosiery.

*Connecticut, Montville. The Monarch Woolen Mills have been incorporated to continue the plant of the Cochegan Woolen Mill. A. H. Arnold is president of the company; Wm. D. Hawkins, vice-president; Wm. H. Gilbert, secretary, and H. G. Hartford, treasurer.

Connecticut, Moosup. It is reported that preliminary work has been started on toward erection of a new weave shed for the Aldrich Mfg. Co. It is stated that new mill will have accommodations for 400 to 500 looms.

*Georgia, Augusta. It is reported that the Warwick Cotton Mills have been purchased by G. H. Nixon, with view to equipping same with modern machinery and putting in operation.

*Georgia, Maysville. We have been advised by Wm. C. Burns (Tech. School, Atlanta), that nothing definite has yet been decided upon regarding

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California, Napa. The California Woolen Mills are reported in financial difficulties and the plant has been closed down.

Connecticut, Derby. The Estate of Chas. B. Alling has discontinued the underwear department. The entire facilities of the plant will be devoted to manufacture of hosiery.

*Connecticut, Montville. The Monarch Woolen Mills have been incorporated to continue the plant of the Cochegan Woolen Mill. A. H. Arnold is president of the company; Wm. D. Hawkins, vice-president; Wm. H. Gilbert, secretary, and H. G. Hartford, treasurer.

Connecticut, Moosup. It is reported that preliminary work has been started on toward erection of a new weave shed for the Aldrich Mfg. Co. It is stated that new mill will have accommodations for 400 to 500 looms.

*Georgia, Augusta. It is reported that the Warwick Cotton Mills have been purchased by G. H. Nixon, with view to equipping same with modern machinery and putting in operation.

*Georgia, Maysville. We have been advised by Wm. C. Burns (Tech. School, Atlanta), that nothing definite has yet been decided upon regarding

the proposed mill here. A committee has been appointed to secure charter, and over one-half the capital stock, $100,000, has been subscribed. A plant of about 5,000 spindles is proposed and looms will be added for weaving.

Indiana, South Bend. At meeting held recently by directors of the South Bend Woolen Company, Samuel Leeper was elected president of the company Capt. C. B. Van Pelt, vice president and W. W. Lewis, secretary and treasurer.

*Iowa, Des Moines. The Bloomfield Mitten & Glove Factory, recently reported incorporated with capital stock of $10,000, is for making cotton flannel mittens and gloves. They operate one cutting machine and 10 sewing machines, using gasoline. John O. Warrington is president of the company, S. F. McConnell, treasurer and Edward Cox, superintendent. Goods are sold direct.

Iowa, Farmington. The Stirling Woolen Mills Company has increased the capital stock from $50,000 to $100,000.

Louisiana, New Orleans. It is reported that negotiations are under way with R. McWilliams for site on which a plant is to be erected for manufacturing cordage, twine, etc.

*Maine, North Dexter. The woolen mill property will be offered for sale July 6th. This plant is equipped with four sets cards, dye house, picker house, etc., and has been operated until recently by the Dews Woolen Co.

Maryland, Baltimore. The committee on readjustment of the securities of the Mount Vernon-Woodberry Cotton Duck Company and the United States Cotton Duck Corporation, has decided upon a plan whereby the two companies will be merged into a new concern, to be known as the Consolidated Cotton Duck Company, with capital stock of $13,000,000; $6,000,000 will be preferred and $7,000,000 common.

Maryland, Baltimore. The Baltimore Woolen Mills Company has been incorporated with capital stock of $250,000, to take over plant which has been idle for some time owing to dissensions in the management. A. C. Bagg, George Vickers and Raymond M. Glacken are interested.

Massachusetts, Atlantic. Bosson & Lane, dye stuffs and chemicals, are enlarging their boiler house and adding a new 60 horse power boiler.

Massachusetts, Boston. The New England Cotton Yarn Company has opened a new office in Chicago, which will be under charge of Peter H. Corr, who will also retain charge of the Philadelphia office.

Massachusetts, Fall River. The Linen Fabric Company has been incorporated with capital stock of $25,000. C. I. Anthony is president of the new company and M. G. Larrabee, treasurer.

Massachusetts, Lawrence. At special meeting of the stockholders of the Arlington Mills, it was authorized to increase the capital stock $2,000,000, making it $5,000,000. Of this $1,000,000 is to be given as a stock dividend from earnings, and $1,000,000 to be offered to stockholders at par, one new for three shares held.

Massachusetts, North Attleboro. The Royal Textile Company has been incorporated with capital stock of $15,000. Daniel G. Sunderland is president of the company, and Arthur T. Parker, treasurer.

*Massachusetts, Taunton. The entire plant of the Watuppa Mills will be sold at auction June 10th. The machinery shipped to Mammoth Springs, Ark., has been sold.

*Massachusetts, Uxbridge. A company is being formed to operate the Calumet Mill, recently reported purchased by Arthur Wheelock, and which is equipped with 8 sets cards and 36 looms. A. & E. Wheelock, L. H. Taft and H. T. Hayward will be interested.

Massachusetts, Uxbridge. The business of C. A. Root & Co. is to be incorporated, probably under the name of C. A. Root & Co., Inc., to be capitalized at $100,000. Mr. Root will hold controlling interest. Among others interested are Mr. Bachman of New York, selling agent, and a number of local capitalists, who have been favorably impressed with the success of this firm the past six years. Starting with about 10 looms, the company is now operating 72. The Waucantuck Mills property, in which they are now located, will be bought, and a number of changes will be made, and the plant somewhat enlarged. The question of installing a dye house will have consideration, and later on some looms may be added.

Massachusetts, Watertown. The Watertown Worsted Company has been incorporated with capital stock of $50,000. John R. Wilson (Providence) is president of the new concern and Geo. Crossland (Watertown), treasurer.

Mississippi, Magnolia. The Mississippi Textile Company's plant has been sold to F. C. Karnrumpf and associates, who will put the mill in operation.

*Missouri, Kansas City. An application has been made for a receiver for the Herschberger-McAfee Woolen Mills Company, and a movement is under way for reorganization, so that the plan of $200,000 woolen mill can be carried out.

Mississippi, Shuqulak. The Noxubee Cotton Mills have been organized with capital stock of $50,000, privilege of increasing to $100,000. W. T. Hubbard, A. M. Tynes and R. L. Anderson are interested.

New Jersey, Bridgeton. The Martin Dyeing & Finishing Company has been incorporated with capital stock of $150,000 by W. L. Martin (Philadelphia), James G. Shaw (New Castle, Del.), and George Hampton (Bridgeton).

New Jersey, Bridgeton. The Bridgeton Woolen Co.'s plant, which was burned out several years ago and which was never started up again, has been sold, it is reported, by the treasurer, James G. Shaw, to a syndicate from Delaware, who will use it for a site for large textile mill which they will erect and put in operation. The old mill was operated on worsteds, cheviots, kerseys, etc., with 5 sets cards and 38 broad looms.

New Jersey, Newark. Harry H. Picking, Fred Lee Palmer and Charles O. Gezer are interested in the Nitram Company, recently reported incorporated with capital stock of $75,000, to manufacture net goods.

New Jersey, Paterson. Morris Bernstein and Meyer Wolf are interested in the American Silk Manufacturing Co., recently incorporated with capital stock of $10,000.

New Jersey, Paterson. The American Silk Thread Finishing Company has been incorporated with capital stock of $25,000, by Xavier Bossart (Paterson) and Joseph B. Whitney and John W. Stewart (Brooklyn).

New Jersey, Paterson. The Fashion Silk Company has been incorporated with capital stock of $25,000.

New Jersey, Paterson. The Sutton & Potts Silk Co. is reported as considering erection of a mill in another locality owing to inability to secure necessary help in present location.

New Jersey, Vineland. It is reported that a hosiery plant is to be established in the old Northrop shoe factory.

*New Jersey, West New York. The Sutro Bros. Braid Co. advises us that although they have property at this place, they do not contemplate erecting additional buildings at present.

New Jersey, Williamstown. It is reported that an effort is being made to establish a rug mill at this place.

New York, Buffalo. It is reported that a silk mill is to be established here by the Manhattan Silk Co. About 200 people will be employed.

New York, Clayville. It is reported that the Standard Silk Co., of Chadwick's, has purchased the Empire Woolen Mills property and that it will be equipped for manufacturing silks.

*New York, Jamestown. The plant formerly operated by the Ahlstrom-Ashworth Co. is now continued by Abraham Ashworth as the Chadakoen Worsted Mill. Yarns are spun on commission. Plant is equipped with one comb, one worsted card and 1,500 worsted spindles (Bradford system).

New York, Middletown. The Wallkill Hat Works are soon to remove to Fishkill-on-the-Hudson, where it will be consolidated with the Dutchess Hat Works.

New York, New York. The Bayview Ribbon Co. has been incorporated with capital stock of $100,000. C. A. Jacobs and Julius Jasper are among the incorporators.

New York, New York. The Continental Felt Company has been incorporated by John Newbold, John Newbold, Jr., and Charles Boegis, to manufacture felt, wool and other fabrics.

*New York, New York. The Ontario Thread Co. is a partnership organized for purpose of tubing and spooling mercerized and silk threads, under management of H. J. Lipman. Sell direct to the manufacturing trade. Buy 2 and 3 ply yarn from 8s to 60s in all grades.

*New York, Seneca Falls. A statement has been filed of the affairs of the Seneca Woolen Mills, recently reported assigned. The total liabilities are placed at $221,094.31, with nominal assets, $277,318.89, and actual assets, $152,395.22. It is stated upon good authority that a compromise will be made with the creditors whereby the plant will resume operations at an early date.

*North Carolina, Charlotte. We have been advised by L. W. Buck (of Bessemer City) that the company has not yet decided about building a mill in this place.

North Carolina, Charlotte. The Mecklenburg Cotton Mills, which were originally planned to be a waste mill, has been changed and is to be operated on plain cotton goods. The plant will be equipped with 15,000 ring spindles and 375 looms. Wm. Coleman is president and treasurer of the company and R. L. Tate, secretary and manager. It is expected to have the plant running this fall.

*North Carolina, Charlotte. The report that the Louise, Hoskins, Chadwick and Dover Mills will be combined is, we learn, untrue. The four mills mentioned are virtually under the same management, although separate organizations, and the report arose from the fact that all the offices of the different companies are to be moved into one building for convenience, instead of having an office at each mill, as at present.

North Carolina, Kernersville. It is reported that the Southern Woolen Mills have been purchased by the Crews Manufacturing Company, which will operate same, after installing new machinery.

*North Carolina, Roaring River. The Damask Manufacturing Co., which was placed in the hands of a receiver some time ago, has been released. The buildings for the new plant have been completed and some of the machinery is ready for installation. Parties interested are confident of securing the necessary capital and starting operations.

North Carolina, Washington. The Washington Knitting Mills, recently purchased by J. D. Kennette, of Raleigh, are now in operation as the Thelma Knitting Mills. W. L. Horah is superintendent.

Ontario, Brantford. It is reported that a company is being organized for purpose of establishing a plant to manufacture woolen hosiery, leggings, etc.

Ontario, Dundas. Wm. Clark & Sons, Ltd., have been incorporated with capital stock of $40,000 by Wm. Clark, Frederick Clark (Dundas) and J. L. Clark (West Flamboro). They propose manufacturing flannels, felts, tweeds, etc.

Ontario, Pembroke. The Pembroke Woolen Mills are now running in full.

Ontario, Peterborough. The Novel-ti Limited has been incorporated with capital stock of $40,000 for manufacturing textiles, haberdashery, cottons, etc. A. G. Ross and G. M. Ewing of Toronto are among the incorporators.

*Ontario, Toronto. The Dominion Bank has secured the properties of the Canada Woolen Mills, which were first bid in by J. L. Long, of Hamilton.

*Oregon, Portland. We have been advised by Thomas Ross, of Las Vegas, that he has not yet fully decided about establishing a wool scouring plant here.

Oregon, Stayton. The Stayton Woolen Mills Company has been incorporated with capital stock of $100,000 by S. Phillippi, F. Carter and W. F. Freres. This company will probably continue

operating the plant of the Stayton Carding & Spinning Mill.

Pennsylvania, Chester. The Lincoln Manufacturing Co., 10th and Morton Avenue, are running their mill full time on combed and carded yarns, warps, cones, tubes and skeins on 12,000 ring and 2,160 twisting spindles. Mr. G. C. Turner, formerly with the Argo Mills Co., Gloucester City, N. J., has just taken a position with this company as superintendent, taking charge of the plant on April 8th.

Pennsylvania, Hazleton. Application has been made for incorporation of the Luzerne Silk Mill Company. Edward J. Gormley, William S. Miller and John Wilhelm are interested.

*Pennsylvania, Kutztown. It is stated that machinery is being placed in the Kutztown Silk Mill by the York Silk Company, preparatory to starting up the plant.

Pennsylvania, New Cumberland. Samuel F. Peters, Custer George and Thomas Clarke are interested in a new dyeing and bleaching establishment reported to be started here.

Pennsylvania, Olyphant. It is reported that a silk company, capitalized at $150,000, will establish a mill here.

Pennsylvania, Philadelphia. Mullineaux, Clegg & Co., manufacturers of wool shoddies, have dissolved. The business will be continued by Alfred, Thomas and B. M. Clegg, as Edward Clegg's Sons.

Pennsylvania, Philadelphia. Albert Herbst & Co., Allegheny Ave. and Emerald St., manufacturers of worsted yarns, are reported to be financially embarrassed and an application for a receiver has been made.

Pennsylvania, Philadelphia. Wallace Wilson's Vigilant Mills, Frankford, in which he manufactures 185 knitters on infants' and misses' ribbed seamless ribbed hosiery is now being run day and night, two sets of hands being employed.

Pennsylvania, Philadelphia. An application has been made for the incorporation of the Smith & Furbush Machine Co., Philadelphia, under which name we understand will be consolidated the business of the Philadelphia Textile Machinery Co. and the James Smith Woolen Machinery Co., thus merging the two largest builders of woolen machinery in the Middle States and joining interests which have operated in similar lines. It will be remembered that the business of the M. A. Furbush & Son Machine Co. was taken over by the Philadelphia Textile Machinery Co. several years ago, giving to the latter concern a complete line of wool preparatory carding and spinning machinery up to the weaving. The merging of these two important companies will enable them to supply the machinery of woolen manufacturers in every particular up to the weave room.

Pennsylvania, Philadelphia. The factory buildings in which the Concordia Silk Mills is operating 154 looms on broad silks and 57 looms on ribbons at 2d and Norris Streets, was sold at auction to G. F. Thompson for the sum of $67,000.

Pennsylvania, Philadelphia. H. W. Swire, of the firm of Swire & Scott, has purchased the interest of Mr. Scott in the firm and has formed a new partnership with Lewis E. Herring and James P. Cairns under the name of Swire, Herring and Cairns. The new firm will continue the manufacture of ingrain carpets and art squares at 111 Huntingdon Street, where they are operating 63 looms by steam.

*Rhode Island, Central Falls. The Flossette Mills Co. have been incorporated with capital stock of $100,000 preferred and $50,000 common stock and will soon take over the Flossette Mills. Franklin E. Warburton is president of the company, James Crossley, treasurer, and Frederick Jackson, superintendent. The capacity of the plant will be doubled.

*Rhode Island, Providence. John J. Clark & Co., recently reported incorporated under Rhode Island laws, is incorporation of John J. Clark & Co., of New York, spool cotton manufacturers.

Rhode Island, Washington. It is reported that the Elite Manufacturing Company is remodeling the plant formerly operated by Benj. Moon, preparatory to putting same in operation.

Rhode Island, Woonsocket. It is reported that E. K. Ray contemplates selling the machinery in the Ray Cotton Co.'s mill, long idle, and remodeling building into stores.

*South Carolina, Greenville. We have been advised by the Woodside Cotton Mills that they are not to increase their plant this year.

South Carolina, Union. The Union Cotton Mills plant was damaged in recent wind and rain storm. A portion of the upper story was blown in. The loss is placed at about $20,000.

South Carolina, Union. Emslie Nicholson is reported as interested in a cotton mill project.

Personals.

Cotton.

W. A. Wood has resigned as superintendent of the Delgado Mills, Burlington, N. C.

John C. Scott, assistant superintendent of the Davis and Brown Mill, Uxbridge, Mass., has resigned.

S. L. Roberts, superintendent of the Riverside Cotton Mills, Danville, Va., has resigned.

W. T. Hurley has resigned as superintendent of the Cabarrus Cotton Mills, Concord, N. C. He is succeeded by W. L. Robinson, who will also be superintendent of the Cannon Mfg. Co.

John H. Dwyer of Lowell has taken charge of weaving for the James J. Regan Mfg. Co., Rockville, Conn.

John Gilligan is now superintendent of the Altamahaw Cotton Mills, Elon College, N. C.

William Sykes, who for the past three years has been foreman of the spinning department in the Manville Mill, has resigned. Mr. Sykes has ac-

cepted the position of superintendent in the Dodgeville, Mass., mill of the B. B. & R. Knight Company.

G. E. Prest, who has been superintendent of the United States Linen Co., Millbury, Mass., for the past 14 months, has resigned. The overseers gave him a royal arch jewel pendant for a watch charm, and expressed their regret that he is to be with them no more.

William Howarth, of Waltham, Mass., has taken charge of the weaving department of the Berkeley Mill, Berkeley, R. I., in place of George M. Smith, resigned.

Richard Poas of Chicopee, Mass., has been appointed overseer of the weaving department of the Ann and Hope Mill, succeeding Marcus J. Woodrow, resigned.

John M. Knox has been elected vice president of the Salisbury (N. C.) Cotton Mills, and resigned the position of agent. C. F. Morris, late with the Cone Export & Commission Company, Greensboro, N. C., has succeeded him as agent.

Thomas Hallows, overseer of carding in the Globe Yarn Mills No. 2, Fall River, Mass., for the past sixteen years, has resigned, owing to ill health.

William Schubert, formerly of the Magnolia Cotton Mills, Magnolia, Miss., is now at the Pacific Mills at Lawrence, Mass.

W. M. Cookson is at present overseer of weaving at the North Pownal Manufacturing Co., North Pownal, Vt.

F. W. Lavene has resigned as overseer of the finishing department of the Palmer Mill, Three Rivers, Mass., after 21 years service, and accepted a position in charge of finishing and napping at the Jackson Co., Nashua, N. H.

William Heaney, overseer of winding, warping and spooling at the Globe Yarn Mills, Fall River, Mass., has resigned. Thomas Welch has taken his place in the spooling room.

Stewart F. Carter, for twelve years technical chemist and general expert at the Windsor Print Works, North Adams, Mass., has accepted a position with the Atlantic Fibre Company of New York City.

Allen Campbell from Valley Falls, R. I., has assumed his duties as overseer of the beaming and filling department of the Boston Manufacturing Co., Waltham, Mass.

Joseph Lovely, formerly at Eclipse Mill, North Adams, Mass., has engaged as boss spinner with the Knoxville Cotton Mills, Knoxville, Tenn.

S. M. Butler, secondhand in the upper weave room of the Silbey Mill, Augusta, Ga., has been appointed overseer of weaving.

W. W. Crosby, who has held the position of principal of the Lowell Textile School since its beginning, has tendered his resignation, to take effect at the end of present term. Mr. Crosby has been offered and accepted the position of assistant treasurer of the Brighton Mills, Passaic, N. J., with headquarters in New York City.

George P. Hall has given up his position as overseer of carding at Granby Mills, Columbia, S. C., and taken his old position as overseer of spinning, spooling and warping at the Pacolet Mills, New Holland, Ga., after being away for fifteen months.

George T. Woolley of Phenix, R. I., has accepted position of secondhand of weaving in Baltic, Conn.

Robert W. Boys, overseer of weaving for the West Boylston Mfg. Co., Easthampton, Mass., has resigned to take charge of weaving for the New Market Mfg. Co., New Market, N. H. On leaving his old position the weavers presented him with a beautiful eight-day clock as a token of respect and esteem in which he was held by those under him. Mr. Boys left with the best wishes of all for every success in his new position. J. Rutledge and J. Aldred, secondhands, were promoted.

John Sanborn, an overseer in the Stark Mills, Manchester, N. H., has resigned.

Charles H. Plummer, agent of the Great Falls Mfg. Co., Somersworth, N. H., has resigned. J. Colby Lewis, superintendent of the Salmon Falls (N. H.) Mfg. Co., succeeds him.

C. Enos Bean, Lawrenceville, is now secretary and manager of the Tennille Yarn Mills, Tennille, Ga.

Elias Richards, who was for many years manager of the Maginnis Cotton Mills, New Orleans, La., will take the position of manager of the Lynchburg Cotton Mills Company, Lynchburg, Va.

D. C. Buchan has succeeded Mr. Cody as overseer of weaving at the Atlas Linen Co., Meredith.

Thomas J. Madden, overseer of the spinning department of the Wampanoag Mills, Fall River, Mass., severed his connection with that corporation recently.

J. A. Parks, formerly boss carder at the Roanoke Cotton Mill Co., Roanoke, Va., has been promoted to the superintendency. T. J. McNeely, formerly superintendent, has been made general manager.

Woolen.

John Burns, overseer of weaving at the Nasonville (R. I.) Woolen Company, has resigned. He has accepted a position with the Moosup (Conn.) Mills of the American Woolen Company, and will act in the same capacity.

William Lord, formerly employed by Joseph R. Foster & Sons, dyers and finishers of cotton, woolen and worsted goods, Philadelphia, has resigned to accept a position with the Kiamensi Woolen Co., Stanton, Del.

Albert Julia has been engaged as assistant superintendent and designer by the Cowan Woolen Co., Lewiston, Me. He is son of Agent C. A. Julia.

Moses Topham, formerly with Hugh Sheridan, Ashuelot, N. H., but more recently with the Baltic Mills, American Woolen Co., Enfield, N. H., is now overseer of dressing at the Dustin Island Woolen Mills, Penacook, N. H.

J. Frank Harrington has been engaged as superintendent of the new Pequot Worsted Company, Danielson, Conn.

Thomas Blanch, who has been superintendent of French & Ward's mill, Stoughton, Mass., for the

past 20 years, has tendered his resignation. Mr. Blanchard began work in this factory as a machinist, and by his own efforts was promoted to the first position in the mill, and has always been held in the highest esteem by his employers and the help. His resignation is caused only by failing health, which it is thought will be improved with a complete rest.

W. N. Oldham, formerly of Utica, N. Y., is overseer of finishing at the Camden, Me., Woolen Co.

Raymond F. Richard has succeeded C. C. Jones as boss finisher at the Granite State Woolen Mills, Guild, N. H. He has recently been at the Elm Mill at Tilton.

Superintendent William H. Butler, William Spencer, assistant superintendent, and Mr. Baxter, overseer of spinning at the Atlantic Mills, Providence, R. I., have severed their connection with the plant. Robert Manley, who has acted in the capacity of confidential clerk for Supt. Butler, has been promoted to the position of superintendent.

George Kendry is the new boss weaver for the Assawaga Company, Dayville, Conn., succeeding Samuel Coggswell, who resigned.

I. J. Johnson, superintendent of the Intervale Mill, Quinebaug, Conn., has resigned.

John F. Webendorfer, who has been the overseer in the weaving department at the Waverly Woolen Mill, Pittsfield, Me., for the past eight years, has resigned his position. Gordon Wayness, Sr., has accepted the position left vacant by Mr. Webendorfer's resignation.

Daniel P. Warwick, formerly designer and assistant superintendent of the Camden Woolen Co., Camden, Me., is the new superintendent at the Saxton's River Woolen Mill, Saxton's River, Vt.

A. C. Houston, for many years overseer of dyeing at the Campbell Mfg. Co., Sangerville, Me., is to become superintendent of the new M. L. Hussey Woolen Co. at Guilford, Me.

Joseph Wood has resigned as superintendent of the Globe Woolen Company, Utica, N. Y. On his retirement from the mill, the employes presented him with a handsome silver water set.

Edward McLaughlin, for some time boss finisher at Kennedy & Britt's Conshohocken Dyeing & Finishing Works, Philadelphia, has accepted a position with Richardson, Weir & Co., who have recently added a department for finishing piece goods, men's wear and dress goods in the same city.

Hugh McKenzie, for many years master mechanic at the Hecla Mill, has accepted a similar position at the Calumet Mill, Uxbridge, Mass.

Alvin McLean, formerly master mechanic at the Atlantic Cotton Mills, Lawrence, has accepted a similar position with the Atlantic Mills, Providence, R. I.

Albert Dean, for the past two years fuller for the Camden Woolen Co., Camden, Me., has resigned. William Oldham, late of Vassalboro Mills, North Vassalboro, Me., has succeeded him.

John Dyer, formerly second hand at the Amos Abbott Co., Dexter, Me., has been promoted to overseer of spinning.

George P. Newell, who recently resigned as superintendent of the French River Textile Co. at Mechanicsville, Conn., has been engaged by W. E. Guild of the Earncliffe Woolen Co. of Providence, R. I., to manage his mill at Greenville, R. I.

Joseph Fisher, overseer of dyeing at the Vassalboro Woolen Mills, North Vassalboro, Me., has retired from mill life, and has been succeeded by his son, John Fisher.

Miscellaneous.

Samuel S. Dale, the editor of the Textile World Record, sailed on May 25th from Boston on the "Arabic" for an extended tour of the textile manufacturing districts of Great Britain, Ireland, France, Holland, Belgium, Germany and Switzerland. He will attend the International Congress of Cotton Spinners and Manufacturers held in Manchester in the early part of June, and meetings of other technical societies of which he is a member.

William H. Deer has resigned his position with Joseph Bancroft & Sons Company, Wilmington, Del., to accept the superintendency of the Brookdale Bleachery, Hohokus, N. J.

William G. McIntire, secondhand in engraving department Pacific Print Works, Lawrence, Mass., has retired after 40 years' faithful service. His associates presented him with a Morris chair and gold headed cane, and extended best wishes for his future.

Tesse Whitworth is the new overseer of the quilt department of the Lowell (Mass.) Bleachery. He was formerly of Claremont, N. H.

Deaths.

William Lee, formerly a well known wool merchant on Front St., died at his home in Germantown, recently. He had retired from business in 1902, owing to ill health.

Joseph W. Hilton, a retired manufacturer of knitting wool, died at his home, Philadelphia, Pa., recently, after a long illness.

M. Blakeley, formerly proprietor of the Rome Silk Mills, Rome, O., died at his home after a short illness.

Enos Verlenden, a member of the firm of Verlenden Bros., Philadelphia, owners of large textile mills, died recently, aged about 55 years.

Frank Gambrill Baldwin, president of the Savage (Md.) Mfg. Co., and a member of the firm of Woodward, Baldwin & Co., commission merchants, died recently, aged 35 years.

Richard Rossmassler, silk manufacturer, died at his home in Germantown, recently. He was born in Germany sixty-three years ago, and came to this country at the age of 25. He founded the Sauquoit Silk Manufacturing Co., with factories in Philadelphia, Scranton and Bethlehem. He was interested in many charitable and educational institutions. A widow, four sons and two daughters survive him.

William J. Crowe, a carpet manufacturer of Kensington, Pa., died at his home in Rockledge, Pa., on May 1st.

New Publications.

[Any work noticed under this head can be obtained through the office of this journal.]

Handy Atlas of the British Empire; by J. G. Bartholemew, F. R. G. S.; pp. 120, 4 by 6. George Newnes, Ltd., London. Price 50 cents.

This is a very useful little atlas being of convenient pocket size. It contains an excellent series of maps including every portion of the Empire and separate plans of the principal cities. There are charts describing the climate and vegetation, tables of population, principal articles of export and import and their value, and the comparative commerce of the Empire with the principal countries of the world. There is also much other information in the book which includes practically everything on the subject that is considered essential.

The Lancashire Cotton Industry; by Sydney J. Chapman, M. A.; 304 pages, 5 1/2 bv 9; Sherratt & Hughes, Manchester and London. Price $2.00.

Nearly one-half the cotton spindles of the world are in operation in the little corner of England called Lancashire, so that a description of the Lancashire cotton industry deals with a very important part of the world's textile industry. The author begins with a chapter on its earlier forms before the advent of the power spinning frame and loom. This takes the history back to the second half of the sixteenth century when the cotton industry was established in Lancashire by refugees from the religious and political persecutions of the Spanish Netherlands. Next comes the factory system which was the natural consequence of the inventions of Arkwright and Cartwright. There is a chapter on the attitude of the employees toward improved machinery and the stories connected with machine wrecking are told in an interesting style. The author also gives a very clear account of factory legislation, doubling and marketing methods. Other chapters deal with localization, industrial specialism, trade unions and organizations of employers, and the book concludes with a chapter on methods of paying wages. The work is evidently the product of much study and research and is commended to the practical manufacturer.

Handbook of Weaving (Handbuch der Weberei); Nicholas Reiser; Parts 3, 4, 5, 6; Arthur Felix, Leipzig, Germany. Price $1.25 each.

In Part 3 the treatment of fancy single weaves is continued with chapters on spotted effects, by either regular or special threads. This is followed by weave decoration in various ways with special sets of warp and filling. Next comes the construction of wide diagonals on a small number of harness. The fourth group which follows includes weaves designed for heavier goods than is possible with base weaves. A detailed description of fancy weaves occupies Part 4 and in Part 5 we find what are called reform weaves, by which either warp or filling is woven to appear alternately on face and back, thus making each thread serve as a backing and a face thread. This subject is completed in the sixth part which also contains an interesting chapter on the twist of yarn. The author treats it in detail and impresses on the reader the importance of twist in cloth construction. The first pages of a chapter on double weaves completes Part 6. The book is profusely illustrated and is a valuable addition to textile literature. The text is in German.

Ho Europe! Ho America! (Hie Europa! Hie Amerika!); Jul. H. West; Franz Siemenroth, Berlin. Price 50 cents.

After spending several months in America the author has given his impressions of American conditions and drawn comparisons between the old and the new world. The book will prove interesting and profitable to Americans as it enables them to see themselves as others see them. It deals principally with the metal industry. The text is in German.

Reform in the Method of Calculating the Cost in Mills (Reform der Unkostberechnung); by A. Sperlich; Gebruder Janecke, Hanover, Germany. Price $2.00.

While this book deals principally with the metal industry the principles on which the various methods of calculating are based could be profitably studied by American textile manufacturers. The subject matter is illustrated with practical examples by which the author's system is readily understood. The text is in German.

Business Literature.

Chain Blocks; Yale & Towne Mfg. Co., New York City.

This booklet is one that was distributed from the booth of the Yale & Towne Mfg. Co., at the recent International Railway Convention at Washington. It contains descriptions and illustrations of various types of chain blocks built by this company, ranging from the small blocks with a capacity of a few hundred pounds to the large loading frames with triplex blocks.

Westinghouse Electric and Manufacturing Co., Pittsburg, Pa.

Circular 1102 relating to the Westinghouse direct current multiple arc lamp and Circular 1104 relating to Westinghouse portable instruments.

Air and Gas Compressors; Worthington Pump Co., London, England.

Catalogue L 150 describing and illustrating a complete line of steam, electric, gas and power driven compressors of all types. It also fully explains the air lift for raising water from wells. It contains much valuable data and many useful tables.

Locks and Hardware; Yale & Towne Mfg. Co., New York City.

A booklet dealing specially with locks and hardware built by this company for railroad use. It was published for distribution at the recent International Railway Convention at Washington and gives an excellent idea of this portion of the Yale & Towne products.

Philadelphia Drying Machinery Co., Philadepphia, Pa., are building new lace machines of improved pattern for Messrs. Sibson & Stern of Philadelphia, for their extensive addition, and also report that they are having a good demand for hurricane steel blade fans, especially their new type of direct connected motor driven fans.

Blackman Fans; The New York Blower Co., Chicago, Ill.

The New York Blower Co., 25th Place and Stewart Avenue, Chicago, Ill., have issued circular No. 61 containing descriptions of the Blackman and propeller fans. It shows the fans with pulleys and direct connected motor and gives all desirable information about them. Especially valuable is the table giving capacities and horse powers. Parties interested in these or in any other style of fan can have a catalogue and other information upon address.

Westinghouse Electric and Manufacturing Co.

E. M. Herr has been elected first vice president and chief executive under the president of the Westinghouse Electric and Manufacturing Company. Few men are more widely known among railway managers than is Mr. Herr and his experience in manufacture and railroad operations will be of the greatest benefit to the company.

The works at East Pittsburg have never been so busy in the construction of railway apparatus as at present. This is due to the fact that nearly all the larger trunk lines are now ready to adopt electric power since the Westinghouse alternating current single phase system has proved such a signal success in practical demonstration. The exhibition tests recently made before the delegates of the International Railway Congress gave the visitors for the first time an idea of the possibilities of electric power in railway service.

Merchant & Evans Co.

Mr. Powell Evans, who was vice president for a number of years and for the past year president of Merchant & Co., Inc., has organized, controls and is president of a new company formed under New Jersey laws, with a capital stock of $500,000, to be known as Merchant & Evans Company, which will continue the old business of Merchant & Co., taking over all its property and assuming all its debts and liabilities. The old organization and personnel remain with the new company unchanged.

Removal Notice.

E. M. Thayer & Co., importers and dealers in dyestuffs and chemicals, have recently removed from their old quarters on Broad St., where they have been located for many years, to more commodious quarters at 411 Atlantic Avenue, a few doors south of Rowes Wharf. Having outgrown their old quarters, they found it necessary to secure larger premises and are now well prepared to handle their business expeditiously and economically. Their telephone is 780 Main.

Spinning and Twisting Rings.

As large manufacturers of ring spinning frames the Howard & Bullough American Machine Co., Ltd., of Pawtucket, R. I., have found it desirable to establish a special department for the manufacture of spinning and twister rings. They have recently issued an attractive booklet, describing this department of their works, giving full details of this line of goods, which includes double adjustable rings, solid single flanged rings, band or narrow twister and vertical twister rings, made from high grade steel of special composition, hardened by special methods and accurately finished, so that they may have the qualities which are especially aimed for; viz., durability and accuracy.

Chemical Stone Ware.

We draw particular attention to the advertisement of A. J. Weeks of 926 East Market St., Akron, Ohio, and his full and complete line of chemical stone ware. This concern pays special attention to the wants of dye houses, finishers, bleachers and textile establishments and they are prepared to furnish their chemical jars in all sizes from a capacity of ten gallons to one hundred fifty gallons each. They are used for acid, chemicals, dye stuffs, etc., and are made in different shapes with or without handles or covers. We would recommend the trade to write to Mr. Weeks for his illustrated circulars, showing the different kinds of jars made, and for his prices.

A Suburban Home.

To live in a suburban city within an hour's ride of New York, to have a home detached and comfortable, with broad stretches of lawn, with trees and shrubs and flowers. To have an abundance of fresh air and plenty of sunshine. These are the ambitions of the pent up city man and when spring time comes to think of the long period of hot and dusty streets—uncomfortable and over-crowded cars to say nothing of the stuffy and closely confined flats is like a nightmare.

New Jersey is perhaps the most widely sought suburban section and well that it might be for it is as accessible as Harlem and far more comfortable. The region served by the New Jersey Central is very popular and offers many advantages. The first thing to be considered is train service and it cannot be denied that the suburban service on the New Jersey Central is the finest in the land. During the rush hours there is a train every fifteen minutes. The road is four tracked. Rock ballasted and since only hard coal is burned there is no dust, no smoke, no cinders. The road has a wide reputation for being on time and the coach equipment used in the suburban service is the best. The towns reached by the New Jersey Central number a score and any one interested in suburban homes should have the book issued by the New Jersey Central known as "Within Suburban Limits." The various towns are described and illustrated and information of value to home seekers is included. Send to C. M. Burt, G. P. A., 143 Liberty Street, for book; it's free for the asking.

A Chapter on the Albany Grease Trade-mark

There are few engineers in active service who do not know Albany grease and its familiar trade-mark. The mark was first used in 1868 and was designed by two lithographers in the employ of Weed, Parsons & Co., of Albany, N. Y., under the instructions of Adam Cook, the original member of the firm of Adam Cook's Sons.

The figure of a boy sliding down a plank, which is the prominent feature of this trade-mark, should be studied in connection with the letters "O-EZR-IC," and these have been the cause of much speculation among users and buyers of Albany grease. Their meaning is decidedly simple and to the point, signifying "nothing easier I see" than to slide down the plank smoothly and without friction when Albany lubricating compound is applied.

At times the letter "O" which in the trade-mark represents the word "nothing" has been confused with the numbers of Albany grease. This is not the case. There are seven numbers or grades of Albany grease running from O to 3 and X to XXX, grade O being the softest consistency in which the grease is made and XXX the hardest. The use of the various grades depends upon the climate in which the grease is to be used and the work it is to do.

The manufacturers guarantee Albany grease to save from one-half to three-quarters of the cost of lubricating by oils, and have on file many testimonial letters received in the ordinary course of business correspondence, which prove their assertions to be correct. It is claimed that Albany grease will assure a clean engine room and no hot bearings, whether the machine on which it is used is slow or fast running, large or small. A suitable cup with a sample of Albany grease will be sent free of charge on application to the manufacturers, Adam Cook's Sons, 313 West St., New York City.

Stafford's New Automatic Loom.

The George W. Stafford Co. of Readville, Mass., report a good business in their different styles of looms. They reported to one of our representatives recently that the automatic loom illustrated in the May issue of the Textile World Record was meeting with very satisfactory results wherever placed, and that in several mills they are running most successfully with thirty looms to a man. Manufacturers interested in this particular line of machinery would do well to confer with the above company to arrange to see these looms in actual operation.

Increasing to Meet Customers' Demands.

The Dobbins Soap Mfg. Co. are building a three story brick addition 108 by 65 feet, with cellar under all, to their already immense factory plant. The constantly increasing demand for their textile soaps renders this addition absolutely necessary. This business was established in 1867 and has grown steadily ever since. The company will gladly send to any mill upon application free samples for test, as they believe in letting their goods tell their own story.

The Kerr Thread Co., Fall River, Mass., one of the mills under the management of the American Thread Co., have recently installed one of the Howard & Bullough American Machine Co.'s hopper bale openers and system of conveying lattice for distributing the cotton to the several mixings.

Attractive Advertisements.

The attention which many large concerns are giving to the preparation of their advertising matter is in marked contrast to the indifference of a comparatively few years ago, when a business card was given to the advertising representative, and copy never changed from one year's end to another. In some lines of business, it is not possible or desirable to resort to sensational or bold methods of advertising. An illustration of attractive and yet dignified advertising is the advertisement of the Cassella Color Co., which, in this journal at least, has become familiarly associated with this advertiser. It is what is known as a clay model advertisement, the original having been carefully modeled in clay and then photographed and a half tone cut produced. Striking effects are obtained from this method. A comparison of the advertising pages of any of the leading trade publications today with those of ten years ago reveals a striking difference in make-up and no greater contrasts are shown than in the advertising pages.

Removal.

Charles A. Johnson & Co., dealers in calico printers' supplies, announce their removal to 55 and 57 Franklin St., New York.

Enlarging Their Plant.

Owing to the increase in the volume of their business, Messrs. Sibson & Stern, Inc., manufacturers of lace trimmings for underwear, Stenton and Wyoming avenues, Germantown, Philadelphia, are installing a number of additional lace machines, together with winding, warping and accessory machines. From the amount of orders already booked, they anticipate that the increased plant will be kept running to its full capacity, and with their enlarged facilities are able to assure the trade of prompt deliveries and a high grade of finished product.

May Extend Its Line.

We are informed that the American Drying Machinery Co. of Philadelphia is contemplating increasing its capital with a view of manufacturing garnett machines.

National Association of Woolen and Worsted Overseers.

The 22d semi-annual meeting of the National Association of Woolen and Worsted Overseers was held at Boyden Heights, Narragansett Bay, R. I., May 20. The meeting was the largest in the history of the organization and much interest was manifested in the proceedings. One of the features of the occasion was the awarding of the prizes for the best essays on "Personal Experiences in Overcoming Mill Difficulties." The first prize, $25, was given to Chas. A. Kennedy, Millbury, Mass.; the second, $15, to Oland Comstock, Lowell, Mass., and the third, $10, was divided between Peter McMillan, Ludlow, Vt., and J. G. Burns, Manayunk, Pa.

Sixty-five active members were received into the association and four associate members. The next regular annual meeting will be held in Boston in November. The business meeting was followed by a banquet at Boyden Heights. Following is a list of the members present: T. W. Biddles, Bloomfield, N. J.; Walter Pickford, Leominster, Mass.; S. Walker, Uxbridge, Mass.; Geo. W. Gerry, Collinsville, Mass.; T. N. Parent, Franklin Falls, N. H.; Geo. N. Biddles, Wakefield, R. I.; Gust. W. Schellschmidt, East Douglas, Mass.; Thomas Buchan, Hyde Park, Mass.; F. L. Whittemore, New Boston, Conn.; James J. Rae, Cherry Valley, Mass.; James Clavin, Mechanicsville, Conn.; Fred Thorp, Belleville, R. I.; Pat. Doherty, Hope Valley, R. I.; J. W. Costello, Wilton, N. H.; Thos. Gordon, Oakland, R. I.; I. Clark Partelo, Rochdale, Mass.; James E. Okell, Pascoag, R. I.; T. C. Cronin, Cherry Valley, Mass.; Louis M. Allison, Worcester, Mass.; A. J. Cox, Mechanicsville, Conn.; W. E. Chamberlain, Nasonville, R. I.; Thos. Pendagast, Lowell, Mass.; Richard O'Donnell, Saugus, Mass.; P. F. Whalen, Mechanicsville, Conn.; Eugene Saxe, Boston, Mass.; John Wilkinson, Clinton, Mass.; W. H. Broadhead, Central Village, Conn.; I. C. Farnsworth, Providence, R. I.; C. A. Kennedy, Millbury, Mass.; James J. Faron, Stafford Springs, Conn.; A. A. Tracy, Rochdale, Mass.; James T. Lord, Blackstone, Mass.; Geo. A. Parent, Whipples, R. I.; Jos. P. Faron, Buckland, Conn.; Ed. H. Heine, Blackstone, Mass.; Paul G. Wetstein, Worcester, Mass.; J. H. Pickford, Clinton, Mass.; Henry Shaw, Leominster, Mass.; Thos. E. Smith, Norwich, Conn.; Sam. H. Gillman, Philadelphia, Pa.; Richard D. Twohig, Providence, R. I.; Chas. E. Hoyle, Boston, Mass.; Jos. Scoville, Uxbridge, Mass.; E. S. Eddy, Worcester, Mass.; Jos. T. Dolan, Worcester, Mass.; Craven Midgely, Lowell, Mass.; John H. Fitzroy, Fitchburg, Mass.; J. A. Jubb, Bennington, Vt.; W. D. Cragin, Uxbridge, Mass.; Asa Garth, Fitchburg, Mass.; Benj. Eyers, Lowell, Mass.; L. W. Eddy, Methuen, Mass.; Albert H. Taylor, Lymansville, R. I.; J. N. Larose, Cherry Valley, Mass.; Walter Nieber, Stafford Springs, Conn.; Jas. Carmark, Providence, R. I.; P. T. Donohue, Woonsocket, R. I.; Richard J. Owens, Providence, R. I.; R. C. Schortmann, Providence, R. I.; C. T. Donlevy, Boston, Mass.; John J. Weeden, Providence, R. I.; Arthur J. Weeks, Nasonville, R. I.; Jos. H. Ridings, East Glastonbury, Conn.; Geo. Kavanaugh, Providence, R. I.; M. J. Dwyer, Nasonville, R. I.; B. V. Searle, Lowell, Mass.; W. S. Nason, Talcollville, Conn.; P. F. Hanlin, Worcester, Mass.; C. M. Hollis, Putnam, Conn.; T. P. Smith, Harrisville, N. H.; F. P. Gallagher, Woonsocket, R. I.; F. H. Graichen, Martinsburg, W. Va.; Fred C. Neff, East Douglas, Mass.; John R. Simpson, West Fitchburg, Mass.; J. Edward Bradley, East Douglas, Mass.; Ulrick Burke, Ludlow, Vt.; Martin J. Nelson, Providence, R. I.; J. W. Linnehen, Boston, Mass.; Frazier L. O'Leary, Boston, Mass.; Peter McMillan, Ludlow, Vt.; M. C. O'Brien, Oldtown, Me.; M. J. O'Brien, North Andover, Mass.; John E. Graham, Lowell, Mass.; Jas. H. Rule, Lowell, Mass.; D. E. Jenkinson, Ludlow, Vt.; Thos. Richmond, Killingly, Conn.; Jas. Cobb, Careyville, Mass.; C. B. Jennings, Webster, Mass.; J. H. Driscoll, Manton, R. I.; Wm. Fraatz, Clifton Heights, Pa.; Jas. J. Joyce, Glenville, Conn.; Chas. O. Gear, Lafayette, R. I.; John H. Sedgwick, Bridgeton, R. I.; John Ingham, Stafford, Conn.; Paul Schmidt, Stafford, Conn.; W. F. Myers, Lafayette, R. I.; David Webster, Chepachet, R. I.; Jos. H. Keith, Passaic, N. J.; Wm. E. Owens, North Oxford, Mass.; Geo. N. Ladd, Spencer, Mass.; John T. McCormack, Hyde Park, Mass.; Martin Welch, Central Village, Conn.; Fred Ashton, Central Village, Conn.; Charles I. Keegan, Uxbridge, Mass.; E. Fred Deverall, Providence, R. I.; Mark Tempest, Holycke, Mass.; J. D. Price, Methuen, Mass.; F. W. Dixon, New York City; Thos. Byron, Saxonville, Mass.; Andrew Smith, Kenyon, R. I.; Wm. Taylor, Holyoke, Mass.; J. B. Jones, Philadelphia, Pa.; Louis Carmark, Providence, R. I.; Edward T. McGlone, North Billerica, Mass.; Herman Ambach, Lymansville, R. I.; Arthur Parkinson, New York City; Geo. R. Burdick, Kenyon, R. I.; J. G. Burnes, Manayunk, Pa.; W. H. Hassett, Worcester, Mass.; Geo. W. Burr, Harrisville, N. H.; Edwin H. Marble, Worcester, Mass.; Eleazer Davies, Plymouth, Mass.; L. J. Prendergast, Woonsocket, R. I.; Ben. Oldfield, Washington, R. I.; Pat. E. Riley, Uxbridge, Mass.; Arthur Loft, Plymouth, Mass.; M. H. Holoran, Mystic, Conn.; Ab. Hey, Woonsocket, R. I.; A. L. Tainter, Lowell, Mass.; Martin O'Toole, Woonsocket, R. I.; Frank J. Devine, Woonsocket, R. I.; Clovis Henault, Woonsocket, R. I.; Eph. Bedford, Thornton, R. I.; Albert Ingleson, Pawtucket, R. I.; Jos. E. Truesdell, Providence, R. I.; Richard Snowden, Lymansville, R. I.; F. L. St. George, North Bellingham, Mass.; F. J. Durkan, Providence, R. I.; Wm. K. Litch, Uxbridge, Mass.; J. C. Weeks, Wilton, N. H.; Thos. S. Drury, Franklin, N. H.; Thos. F. Crofwell, Ashaway, R. I.; James A. Toop, Washington, R. I.; James McDowell, Providence, R. I.; J. J. Henderson, Cordaville, Mass.; Samuel Walsh, Mechanicsville, Conn.; John Boyes, Lymansville, R. I.; Oscar Dietrich, Woonsocket, R. I.; Daniel F. Welch, Millbury, Mass.; Dennis Duffy, North Bellingham, Mass.; Geo. W. Padien, Woonsocket, R. I.; James Mullin, North Bellingham, Mass.; Thomas Mullin, Franklin Falls, N. H.; James

Minto, Jr., Providence, R. I.; James S. Turner, Lowell, Mass.; Joseph A. Holmes, Putnam, Conn.; A. E. Sproul, Boston, Mass.

The Philadelphia Textile School Graduation Exercises.

The commencement exercises of the Philadelphia Textile School were held in the Academy of Music on May 31. The report of the principal showed the school to be in a very flourishing condition. Many additions to the equipment have been made, especially in the department of research, which is of great service not only for industrial establishments, but for the United States Government. After an address by the president, Theodore C. Search, the exercises were closed by an address on "American Ideals" by Franklin Spencer Edmonds.

In the regular textile school diplomas were awarded to Paul Benninghofen, Benjamin N. Chanalis, Frederick J. Coe, Jerome E. Emerson, Harold H. Hart, John Headman, Evan G. McIvor, Francis V. O'Hara, James O. Stewart and Schuyler J. Taylor.

The Textile World Record's gold medal for general excellence and thesis in the chemistry and dyeing course was awarded to Joseph Collingwood; honorable mention to John H. Fiebiger. New England Cotton Manufacturers' Association Medal, for general excellence, regular course, third year, to Evan Gordon McIver; honorable mention to Jerome Everett Emerson and Schuyler Justice Taylor. Associate Committee of Women's Prizes, $10, for best executed work in jacquard design, third year, to Jerome Everett Emerson. The Miss Clyde Prize, $10, for best executed work in jacquard design, second year, to Hans Henry Hoermann; honorable mention to Robert Emmett Brooke. Mrs. Frank K. Hipple Prize, $10, for best special executed work in jacquard design, to William Thomas Lockett; honorable mention to Charles P. A. Bosetti. The Mrs. Thomas Roberts Prize, $10, for best group of designs for decorative fabrics, to Lawrence M. Pegram. The Elizabeth C. Roberts Prize, $10, for best work in color harmony and design, first year, to Caryl A. Grammar; honorable mention to Alan V. Young and Alfred W. Haywood, Jr. Chemical Trade Review Prize, Chemical Balance, for best seminar work in chemistry, to Lawrence Anthony Stead. Ab Kirschbaum & Co. Scholarship, for highest rating in first year regular course, to Myron S. Freeman. Prize Scholarships for School Year 1905-1906, to Louis Hart Talcott, Joseph Collingwood, Frederick G. Kennedy (evening class), Thomas E. Guerin (evening class).

After the exercises a reception was held in the school building, where there was an interesting exhibit of the work done by the students in all departments.

One of the most interesting features of the exercises, which brings graduates from all parts of the country, is the annual meeting of the Alumni Association. The fourth of these interesting occasions was held on May 31. At the business meeting the following officers were elected: President, Bradley C. Algeo; first vice-president, Carl Hennicke; second vice-president, Charles Bond; honorary vice-president, Theodore C. Search; secretary, William H. Stafford; auditor, Channing Smith; treasurer, William Steele; directors, Samuel Butterworth, H. H. Bosworth, Chas. E. Firth, Willis Fleisher, Wm. C. Robb, H. J. Maynard. Papers on technical topics were read and discussed and it was voted to authorize the directors to incorporate the association under the laws of Pennsylvania. The day of June 1 was spent in visiting points of interest on the river and about the city, giving the alumni an opportunity of renewing old friendships. In the evening the annual banquet was held at the Hotel Majestic and surpassed all previous occasions of the kind. The menu was most artistically arranged and on the front cover was the seal of the school woven in silk by the students. Inside was a list of the "filling." President Algeo acted as toastmaster and the principal address of the evening was given by Clarence Whitman, of New York, on "The Field for Textile Graduates in the General Textile Industry." Chas. H. Harding spoke on "Some Phases of Woolen Manufacturing." Responses to the toasts were made by Theodore C. Search, Joseph F. X. Harold and J. H. Bragdon. The meeting was the most successful that has yet been held and the alumni report, which will contain a full list of the papers and names of the officers and members, is being printed for distribution to all members of the association. Any former students who have not yet joined the association are invited to do so.

The Lowell Textile School Exercises.

The sixth annual commencement exercises of the Lowell Textile School were held in Southwick Hall on the evening of June 1. President A. G. Cumnock presided and introduced the speakers. Sidney B. Paine of the General Electric Co. delivered an interesting address on the electric drive in textile mills. Probably there is no man better acquainted with the developments of the use of electricity in textile mills than is Mr. Paine. He alluded to the new high speed spindle, one of which he saw a few weeks ago running at a speed of 45,000 revolutions without a tremor. This speed is, of course, too high for practical purposes, as the front roll cannot be run at a corresponding speed. He had, however, seen a frame of these spindles running at 12,000 revolutions per minute, spinning 32s yarn with filling twist, the front roll having a speed of 190 revolutions per minute. The staple used was 1 3/8 Egyptian, the yarn being spun from 10 hank roving. The production of this frame will average better than 2 pounds per spindle per week.

President Cumnock spoke on the general subject of textile education and what it had accomplished. He alluded to the benefactions of Frederick Fanning Ayer, the Kitson family and the Kitson Machine Shop, and the Billings estate. He also spoke in terms of appreciation of the services of Principal Crosby who resigns his position to engage in active mill work. He then introduced that gentleman, who was greeted with great applause.

Prof. Crosby spoke of the value and meaning of a technical education and of the good that had been and would continue to be accomplished by the Lowell Textile School and its graduates.

The medal of the New England Cotton Manufacturers' Association for excellence in cotton studies was awarded to Henry S. Adams, Haverhill, Mass. Diplomas were awarded as follows:

Course I, Cotton Manufacturing—Henry Shaw Adams, Haverhill; George Andrew Boyd, Oakdale; George Everett Carr, Adams; Charles Edward Harris, Easthampton; James Louis Hollings, Dorchester; Everett Byron Moore, Lynn; Everett Nichols Parker, Lowell; Everett Leander Thompson, North Woburn.

Course II, Wool Manufacturing—James Thomas Cole, Medford; Philip Hamilton Warren, Worcester; Stanley Herbert Wheelock, Uxbridge.

Course III, Designing—James Henry Di lon, Belchertown; Everett Amos Jones, Lowell.

Course IV, Chemistry and Dyeing—Russell Weeks Hook, West Medford; Walter Scott Lewis, Woburn; Hugh Francis McKenna, Woburn; Arnold Joseph Midwood, Lowell.

Immediately after the exercises the alumni met and elected as trustees Henry A. Bodwell of Andover, Mass., for two years, and Paul T. Wise, West Chelmsford, Mass., for one year.

Among the interesting incidents was the presentation of the handsome Knight Templars' charm to Principal Crosby by the faculty.

The Lowell Textile School Alumni held their banquet at the St. Charles Hotel in the evening, which was attended by over 100 members, many of them coming from out of town. Among the speakers were Principal Crosby, H. A. Bodwell, Paul Wise, Treasurer James T. Smith and Profs. Umpleby, Barker, Olney and Nelson.

The New Bedford Textile School Exercises.

The graduating exercises of the New Bedford Textile School were held in the evening of June 2. Among the prominent men present were Lieut. Gov. Guild, and President Henry S. Pritchett of the Massachusetts Institute of Technology, both of whom made addresses. Lieut. Gov. Guild's topic was the leading position of Massachusetts among the states due to the skill and experience of her inventors and manufacturers and advocated the value of technical training. President Pritchett made the principal address of the evening, taking as his subject: "Industrial Training as a Factor in Nation Building."

President Hatch of the Textile school presided and told of the progress of the school up to date. During the six years it has been established, forty-three have been graduated from the full course, three from the evening course, while about four hundred and sixty certificates have been issued to day and evening students who have completed one or more of the courses in the various departments. He announced that the New England Cotton Manufacturers' Association's medal for the highest standing during the three years' course was awarded to Rex G. Wetherbee of Utica, N. Y. The final event of the evening was the awarding of the diplomas. The graduates who received them were as follows:

General Cotton Manufacturing Course—James O'H. Cazenove, John J. W. Cooper, Sidney W. Corson, Otis P. Mills, Jr., Clifford H. Tripp, Rex G. Wetherbee.

Cotton Carding and Spinning Course—Murray F. Barrows.

Designer's Course—William B. MacColl.

Seamless Hosiery Knitting Course—Fred L. Baldwin.

A large number of other students in shorter courses received certificates.

New England Prospering.

AND YET UNCHANGED FROM COLONIAL DAYS.

New England history, thrift and progress, commenced when the Pilgrims landed at Plymouth in 1620. They worked untiringly and unceasingly for the establishment of commercial centres and industrial markets; and the present flourishing manufacturing and commercial activity of the Hub shows how well they succeeded. But Nature appeared on the scene long before our early progenitors and shaped the bays and shore line; piled up the mountains and artistically laid out the lake and valley lands. The "Crystal Hills" long, long years ago were the sacred haunt of the red men's Manitou, the lakes and rivers, the aborigines' fishing grounds, and the magnificent sea coast was their haven of rest. Then the "pale face" came, and afterwards was the advent of the railroad.

Busy marts, high mountains, lake and inland sections and the entire sea coast were all linked by the great steam railroad. Climatic conditions have not changed, nothing new, except the opportunity to get there, and what additional charms hotel men and landscape artists have added.

Summer is the vacation season, New England the vacation land, and the Boston & Maine Railroad the vacation road. You don't know New England unless you know her resorts; and the Boston & Maine General Passenger Department, Boston, has just published a beautiful book of 90 pages telling all about New England resorts, how to get there, where to stop and what it costs. Send your address, the book is free for the asking.

Softening Oil.

As the warm days approach it is important to have a softening oil for warps which is reliable and in sweet condition summer and winter. Those who use soluble softening oil, made by the Arabol Manufacturing Company, 100 William Street, New York, are confident they have that kind of oil. As a softener it is preferred to tallow and other oils and greases. It gives a smooth finish to the warps, the threads divide well in the lease rods, and the cylinders of the slasher remain perfectly clean. It is neutral and most suitable for closely woven and strong goods, such as corduroys, velveteens, sateens, twills, umbrella cloths, cambric warps, etc., and is easy to handle.

Albany Grease Calendar.

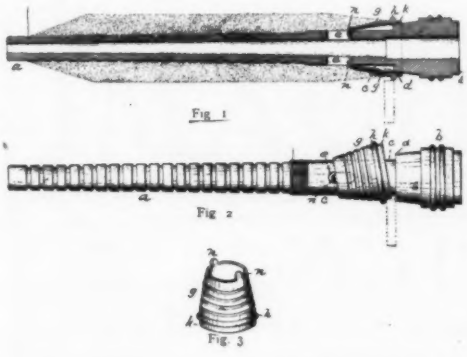
Adam Cook's Sons, 313 West St., New York, proprietors of the genuine Albany grease, have issued an attractive calendar, in which some of the features of their product are emphasized, not omitting the well-known trade-mark of the happy gentleman enjoying his toboggan slide on an Albany greased plank.

Recent Textile Patents.

BOBBIN FOR COTTON Looms. 788,806. John H. Whitten, Manchester, N. H.

This invention relates particularly to bobbins of the style provided with a filling change such as are used in the Draper looms, and more specifically to bobbins which are provided with a cone on the spindle which receives the blows of the feeler and is held in position by the thread until but little thread is left on the spindle, when the cone falls or yields and allows the bobbin to be thrown off.

Figure 1 is a longitudinal section of the bobbin



in a full condition. Fig. 2 is an elevation of the bobbin with the thread nearly unwound from it and the cone in position to allow the bobbin to be thrown off. Fig. 3 is a view of the cone removed. The location of the feeler is indicated by dotted lines in Figs. 1 and 2.

CARD PUNCHING MACHINE. Jacquard 790,126. Harry Hardwick, Philadelphia, Pa., assignor to Ivins, Dietz & Metzger Co., Philadelphia, Pa.

CARDING ENGINE Feed. 789,479. Colonel M. Barber, Monson, Mass.

CARDING MACHINE, Bat Forming and Delivering Device. 789,772. Emil Tyden, Hastings, Mich.

COMBING MACHINERY. 790,757. Sugden Shackleton, Keighley, England.

COTTON PICKER. 788,238. Sobieski L. Bond, Charleston, S. C.

COTTON PICKING Machine. 788,812. John F. Appleby, Chicago, Ill., assignor to the Dixie Cotton Picker Co., Redfield, N. D.

COTTON WOOL. Treating. 789,341. Benjamin F. Taylor, Bridgeport, Conn., assignor to Chas. A. Coe, Boston, Mass.

FABRICS. MANUFACTURING Colored. 790,718. Carl Bucher, Gera, Germany.

FIBERS. SEPARATING and Cleaning Hemp. 789,504. Michael C. McLane, San Francisco, Cal.

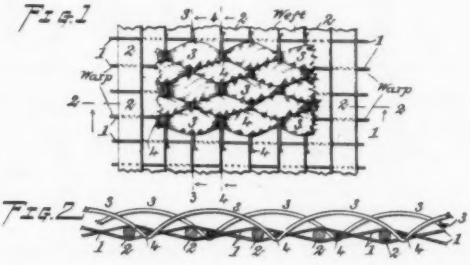
FIBRE CLEANING Machine. Vegetable. 790,307. John H. McCauley and Edgar M. Winfrey, Wichita Falls, Texas

FLAX, HEMP, ETC. Rippling Machine for. 790,802. Carl F. Petermann, Chemnitz, Germany.

FLEECING OR NAPPING Attachment. 790,722. Frank Chatfield and James Struthers, Minneapolis, Minn.

FABRIC. Woven. 789,130. Hovcep Sarafian, Yonkers, N. Y.

The object of this invention is to produce an improved fabric which shall be distinguished by cheapness and yet present an ornamental appearance. It is composed of a body or under portion consisting of cheap yet strong and durable material—such as cotton or jute—and a top or surface portion of better and more ornamental material, such as worsted or silk.



The invention is embodied in the manner of arranging the threads or strands composing the ornamental surface material and the weft for tying in or securing of the same to the body or bottom portion.

Figure 1 is a plan view illustrating the arrangement and interweaving of the top or ornamental material with the body of the fabric. Fig. 2 is a longitudinal section on the line 2 2 of Fig. 1, the several threads or parts composing the fabric being shown widely separated for the sake of clearer illustration.

KNOT TYING Machine. 789,468. Stillman A. West, Brookline, Mass.

LOOM BOBBIN. Cotton. 788,806. John H. Whitten, Manchester, N. H.

LOOM BRAKE Mechanism. 789,388. Eppa H. Ryon, Worcester, Mass., assignor to Crompton & Knowles Loom Works, Worcester, Mass.

LOOM NEEDLE OR Wire. Pile Fabric. 790,016. William Wattie, Worcester, Mass., assignor to Crompton & Knowles Loom Works.

LOOM PILE FABRIC. 790,028. James Buckler, Worcester, Mass., assignor to Crompton & Knowles Loom Works.

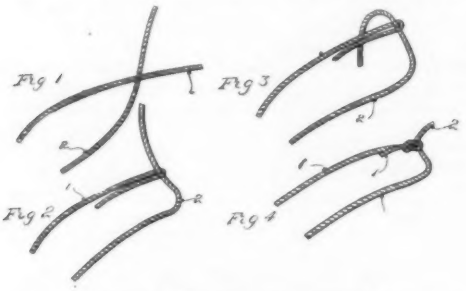
LOOM PILE FABRIC. 790,017. William Wattie, Worcester, Mass., assignor to Crompton & Knowles Loom Works.

LOOM REBOUND Preventing Means. 789,257. James H. Cobb and James H. Mehaffey, Belton, S. C., assignors to Draper Co., Hopedale, Mass.

KNOTS. METHOD of Tying. 789,467. Stillman A. West, Lynn, Mass.

The essential steps of this method of tying a knot consist in first causing to cross each other at an angle, substantially as represented in Fig. 1, the ends of the two threads, which are to be united.

The free extremity of one of the threads—as, for instance, that marked I—is then bent around the other thread bringing such free extremity back into close proximity to the main portion of the thread and forming thereby the bight which is represented in Fig. 2. The free extremity of the other thread 2 is then carried to one side and behind the parallel portions of the doubled thread 1, as shown in Fig. 3, and again brought to the front, passing it over the said parallel portions of the thread 1 and inserting it between such parallel portions and itself, as represented in Fig. 4. This effects the interlocking, and on tightening the knot the latter is completed.



LOOM CONTROLLING MEANS. 789,363. George M. Foster, Manchester, N. H.

LOOM FOR CROSS Weaving. 788,328. George H. L. Pettie, Philadelphia, Pa.

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LOOM ELECTRICAL STOP Mechanism. 788,875. Frederick M. Armstrong, Pawtucket, R. I., assignor to Kip-Armstrong Co.

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LOOM FILLING REPLENISHING. 789,287. Alida M. Marcoux, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM HARNESS OPERATING Mechanism. 789,845. Clare H. Draper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM LAY. 789,343. William Wattie, Worcester, Mass., assignor to Crompton & Knowles Loom Works.

LOOM LAY Motion. 789,762. Georg Schwabe, Bielitz, Austria-Hungary.

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LOOP BANDING MACHINE. 790,458. Alonzo E. Rhoades, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

PILE OF FABRICS, Machine for Cutting. 790,577. William G. M. Keighley and H. Netherwood, Huddersfield, England.

SHUTTLE SPINDLE. 790,611. William R. Bell, Slatington, Pa., assignor to Norbert Foerster, Slatington, Pa.

PILE FABRIC, Woven. 789,020. Fritz Hammer, Philadelphia, Pa.

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SPINDLE BOBBIN Clutching Means. Rotatable. 789,312. William E. Allen, Salem, Mass., assignor to Sawyer Spindle Co., Portland, Me.

SPINDLE AND BOBBIN CONNECTOR. 788,282. Frederick W. Saworski, Walpole, Mass.

SPINNING FRAME TRAVELER CLEARER Ring 789,455. Charles E. Riley, Newton, Mass. assignor to Howard & Bullough American Machine Co., Pawtucket, R. I.

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TWISTING FRAME STOP MOTION. 789,777. Owen Williams, Fall River, Mass.

WINDING MACHINE. 789,602. George W. Foster, Westfield, Mass.

WINDING MACHINE. 789,601. George W. Foster, Westfield, Mass.

WINDING MACHINES, Automatic Tension Device for Yarn. 789,522. Horatio B. Beckman, Newburgh, N. Y.

WARPER COMB FOR COARSE YARNS. 790,077. Alonzo E. Rhoades, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

WINDING OR UNWINDING GOODS, Device for. 788,133. Joseph S. Harrison and Robert L. Simpson, Greely, Colorado.

WOVEN FABRIC. 789,130. Hovcep Sarafian, Yonkers, N. Y.

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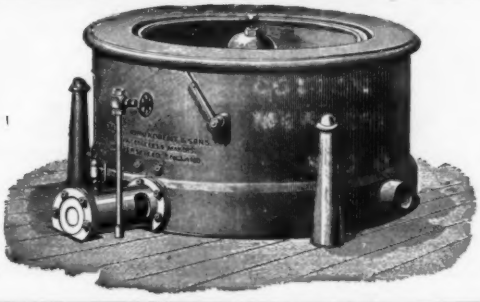

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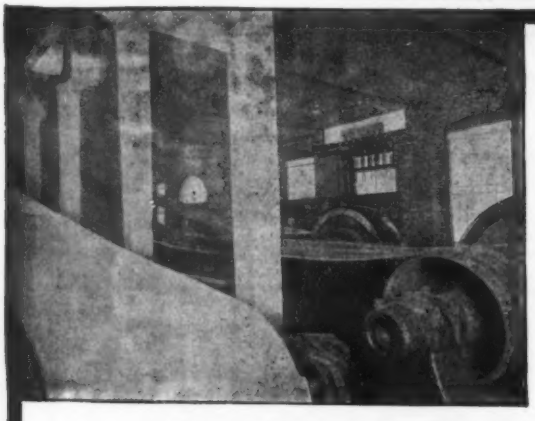

JAMESTOWN, N. Y., Oct. 27, 1904.

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GENTLEMEN:—The data herewith explains the conditions of the belts you have photographs of.

Our engine is 1000 H. P. The belts run from two 20 ft. pulleys (62 R. P. M.) to two 31" pulleys (450 R. P. M.) The large belt is 40" face, double leather, on 45 ft. centers The shorter belt is 40" face, also double leather and on 35 ft. centers. The two belts were doing 500 H. P. when photographed and could do much more.

I have used Cling Surface here for five years and am entirely satisfied with it. These belts are clean, not sticky, pliable and in fine condition and the larger is running with a sag of 4 ft., while the smaller is 22" slack. I believe in slack belts and Cling-Surface permits me to run them so.

Yours very truly,
W. H. COBB, Chief Engr.,
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Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

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Suck, Adolph.

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Kitson Machine Co.
Leigh, Evan A.
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Philadelphia Textile Machinery Co.
Schofield, Wm. Co.
Woonsocket Machine & Press Co.

Balling Machine.
North Chemsford Machine Co.
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New England Butt Co.
Textile Machine Works.

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Green Fuel Economizer Co.

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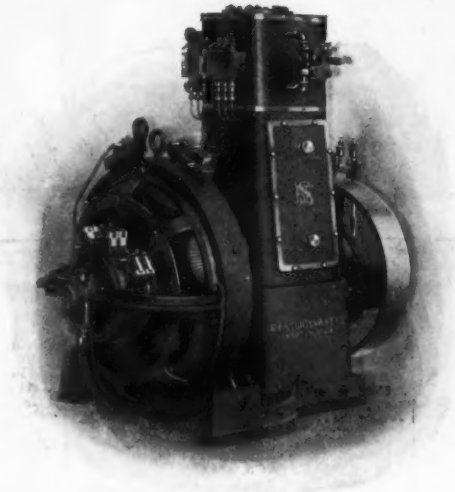

Improved method of lubrication gives highest mechanical efficiency to the engine. All running parts enclosed yet accessible.

The generator is conservatively rated; has heavy overload capacity, low temperature rise and improved ventilation.

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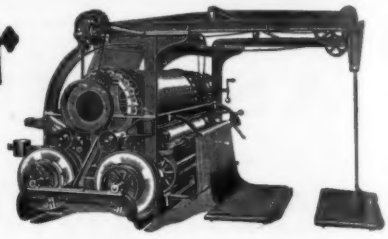
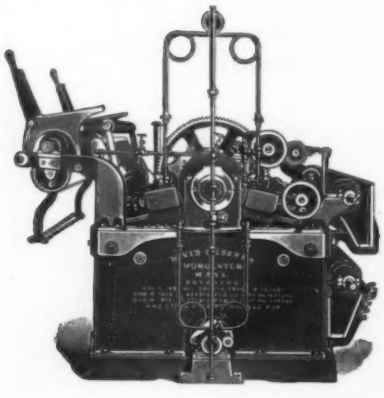
426

David Gessner

Worcester, Mass.





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Sawyer Mann Electric Co.
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Bowes, L. M., Co.

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Garland Mfg. Co.

Looms.
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Crompton-Thayer Loom Co.
Draper Company.
Kilburn, Lincoln & Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
Stafford, G. W., Mfg. Co.
Stoddard, Haserick, Richards & Co.
Whitin Machine Works.

Loopers.
Hepworth, John W. & Co.
Leighton Machine Co.

Lubricators.
Cook's, Adam, Son.
Borne, Scrymser Co.
Dixon, Jos., Crucible Co.
Lunkenheimer Co.

Lug Straps.
Bond, Chas.

Lumpers.
Gerry, George & Son.
Schofield, Wm., Co.

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Lamb, J. K., Textile Mach. Co.
Schofield, Geo. L.
Stead, Arthur.
Taylor, James.

Machinists' Tools.
Curtis & Marble Machine Co.
McCabe, J. J.
Whitin, The D. E. Co.

Mails.
Walder, J.

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Elliott & Hall.
Fabric Measuring & Packaging Co.

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American Blower Co.
Boston Blower Co.
Buffalo Forge Co.
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Dean & Main.
Murray Iron Works Co.
Philadelphia Drying Machinery Co.
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Suck, Adolph.

Mercerizers.
Greenwood & Bault, R.
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Lorrimer, Wm. H., Sons Co.

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Whiteley, William & Sons, Ltd.

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Mill Brushes.
—See Brushes.

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—See Sewing Machines and Supplies.

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Barker, James.
Bond, Chas.
Buckley's, Benj., Son, Gun Mill.
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Eureka Fire Hose Co.
Garland Mfg. Co.
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——See Electric Motors.

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Jones, Lewis.
Leigh, Evan A.
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Malcolm Mills Co.
Ryle, Wm. & Co.

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Tucker, W. & C. F.
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——See Ventilating.

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Woonsocket Machine & Press Co.

Pressers and Flyers.
Baker Machine Co.

Pressure Regulators.
Crosby Steam Gage & Valve Co.
Mason Regulator Co.
Walworth Mfg. Co.

Pulleys.
——See Power Transmitting Machinery.

Pulley Covering.
Warren Company, The.

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——See Commission Merchants.

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——See Power Transmission Machinery.

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Heusch, Severin.

Shearing Machinery.
——See Dyeing, Drying, Bleaching and Finishing.

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Shell Rolls.
Thurston, A. G. & Son.

Shoddies.
——See Wool Shoddies.

Shuttles.
——See Bobbins, Spools, Shuttles, Etc.

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Albany Steam Trap Co.
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——See Warp Stop Motions.
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Chapin, George W.
Friedberger Mfg. Co.
Krout & Fite Mfg. Co.
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Pettes & Randall Co.
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Dodge Cold Storage Co., United Telpherage Dept.
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Draper Co.
Tentering Machines.
——See Dyeing, Bleaching Machinery, Etc.
Tenter Clips.
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Textile Schools.
——See Schools.
Ticketing Machinery.
——See Labeling Machines.
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Metallic Transfer Co.
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Coburn Trolley Track Co.
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Trucking.
McKeon, John F.
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——See Water Wheels.
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Water Softeners.
Ford, J. B., Co.
Philadelphia Water Purification Co.
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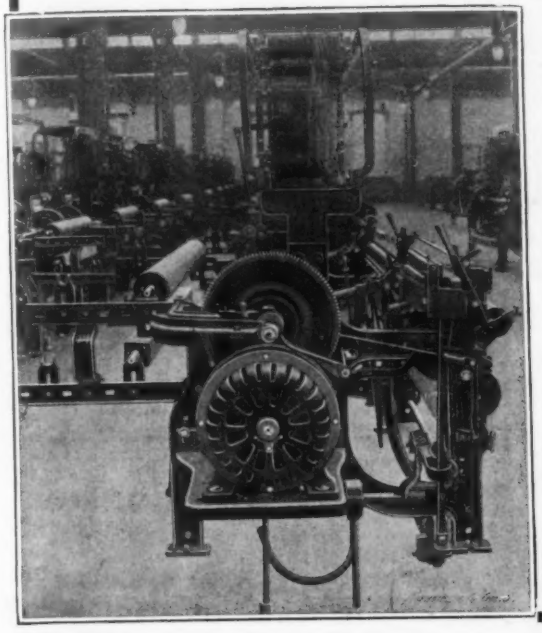

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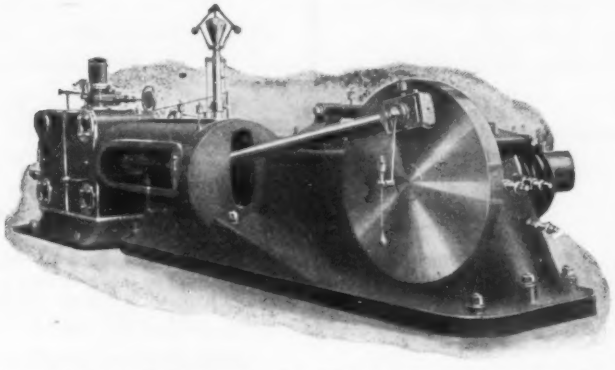

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127 South 2d St., PHILADELPHIA, PA.
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TAYLOR, WORDSWORTH & CO., Leeds, England.

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Manufacturers' Agents.
General import and export business between
The UNITED STATES,
JAPAN and CHINA.
Special attention given to COTTON FABRICS and to COTTON MILL MACHINERY.
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Speed & Stephenson,
170 SUMMER STREET, BOSTON.
IMPORTERS AND DEALERS IN
NEW AND SECOND-HAND
Worsted and Woolen Machinery
A Large Supply of Worsted Machinery
Always on Hand.

New and Second-Hand
COTTON OR WOOLEN
MACHINERY
of Every Description may be had at Low Prices from
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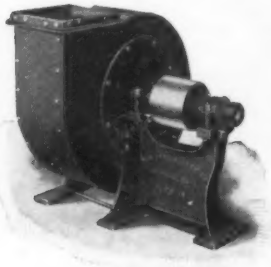
Send for List and state what you want.
AGENT FOR THE WESTON HYDRO EXTRACTOR.



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One-Piece Fan Wheels
will handle any stringy material as well as dust.
They are efficient and lasting, run steady and cool.
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THE NEW YORK BLOWER COMP'Y,
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Factory, Bucyrus, O. Sydnor Pump & Well Co., Richmond, Va.

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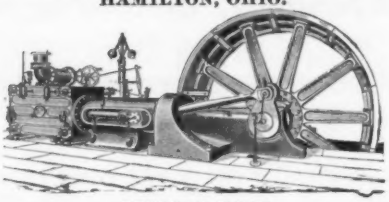

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We have as large a stock of Second-hand Machinery as there is in New England.

Note these Special Lots of Cotton, Woolen and Worsted Machinery.

One Wool Washer, 3 Bowls.
One Sargent Wool Dryer.
One 60″ Breast Worsted Card.
One 48″ Licker-in Worsted Card.
Two Backwashers.
Eight Ball Winders for Combs.
Several Gill Boxes for before and after Combs.
Two Noble Combs.
Several Can and Spindle Gill Boxes.
Several Sets of Drawing.
Forty Reducers and Rovers.
Ten Cap Frames, mostly Prince Smiths.
Cap Trap and Ring Trap Twisters.
Ten Sets Woolen Cards.
Ten pair Woolen Mules.
Twenty 48″ Bramwell Feeds.
Thirty-five Knowles Looms, 72″.
Fifteen Knowles Looms, 92″.
Sixty Crompton Looms, 92″.
1 4-Bowl Crab.
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One Kitson Cotton Opener.
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10,000 CAPS, TUBES AND SPINDLES, ALL SIZES, WITH TENSION PULLEYS.
1,000 SPINNING TOP ROLLERS, WOOD BOSSES, 3 1-2 in. PITCH.

This machinery must be moved in order to make room for a large consignment now on the way.

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DYESTUFFS, DYEWOOD EXTRACTS.

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Rates, 15 cents a line per issue when replies are sent in care of TEXTILE WORLD RECORD to be forwarded. If replies go direct to advertiser the rate is 10 cents per line per issue. Count seven words to a line and include side head and address. Cash must accompany the order for these ads. If such ads. are "displayed" the rate is $2.00 per inch single column each time.

Mill Property for Sale

All Property of the Hutchins Narrow Fabric Company

138-140 Wilbraham Aveune, Springfield, Mass. Two story mill built especially for the business in 1896, on N. Y., N. H. & H. R. R., 233x80 and a wing 74x65; also extra land. About 180 looms making narrow fabrics, tapes, non-elastic webs, etc., etc. Mill modern and in splendid condition—boilers, engines, etc., etc. Insurance rate low. As 90% of the indebtedness is to a very few creditors, banks, etc., the right parties can probably obtain very satisfactory terms for taking over this property as a whole.

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HOSIERY MILL FOR SALE.

For sale, Hosiery Mill with a daily capacity of from two to three hundred Ladies' and Misses' goods. Situated in a Pennsylvania town where skilled labor is abundant. Good reasons for selling. For particulars, address

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VALUABLE WOOLEN MILL PROPERTY

inventory over $100,000.00, located near Pittsburg, to close an estate. Administrator is a lumberman and would trade for timber or real estate.

Address, "Exchange," care Textile World Record, Boston, Mass.

FOR SALE.

SECOND-HAND STEEL BOILER,

5 foot shell, 94 tubes, 3 in. diameter, 14 ft. long; made by Crawford of Nashua. Flush front, with McClave shaking grate bars, all in good order, with water column, gauge and safety valve. Just replaced with larger size. Price $150 on our Mill yard. A bargain.

High Rock Knitting Co., Philmont, N. Y.

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DEALER AND JOBBER IN **Textile Machinery, New and Second Hand**

24 Bridesburg Looms, 24 Harness Stafford Dobbies, 1 Beaming Frame, 120-inch, Altemus make, 1 Beaming Frame, 80-inch, Altemus make, 1 36 Spindle Bobbin Winder, Altemus make, 1 Warping Mill with Creel, Altemus make.

Will buy Odd Lots of Yarn of Any Kind
Send Samples and Price

DYE WORKS FOR SALE

Machinery, Contracts and Good Will

of well known dyeing business, established 15 years and now operating at a profit.

Dye and finish wool piece goods and cotton and wool yarns. Long lease on buildings. Price $10,000. Address, C. H. HALL, 5359 Jackson Avenue, Chicago, Ill.

YARN MILL FOR SALE.

A BARGAIN

A five set yarn mill complete with dye house, housed in two story brick building 300 x 60 feet, with fire proof warehouse, tracking facilities, etc. This mill is fully equipped for manufacturing single and twisted yarns. If desired can include fully equipped knitting plant for the manufacture of gloves, mittens and hosiery.

LAKESIDE KNITTING COMPANY,
Elkhart, Ind

FOR SALE.

Dye Tubs, Hydro-Extractor, Kiers, Hurricane Dry House, etc., etc.

ALSO

Automatic Machine for Mercerizing Skein Yarns

Address, W. C. REYNOLDS, Norwich, Conn.

WANTED.

Second-Hand Calico Printing Machine.

Five or more colors, 55 in. to 60 in. wide. Address "P M," care Textile World, Record, Boston, Mass.

Waterproofing Plant For Sale.

Has been in successful use in one of the largest factories. The machinery is up to date and in good working order. Can be seen by interested parties, and will be sold at a low figure to a quick purchaser. Full particulars on application. Address, "Waterproof," P. O. Box 718, N. Y. City.

BARGAINS FOR SALE

DYNAMOS — ENGINES

1 40 K. W. Direct Connected Set.
1 200 K. W. Direct Connected Set.
1 50 K. W. Direct Connected Set.
2 14x7x10 Deane Duplex Pumps.
100,000 ft. assorted widths single and double Leather Belting.
50,000 ft. Steam Pipe, assorted.
Boilers, Engines, Dynamos, Motors.
Write for Prices.

THOMPSON-BONNEY CO. 45-47 YORK ST., Brooklyn, N. Y.

FOR SALE

High grade underwear factory, located in the middle west. Labor conditions first-class. Now running on paying basis. Full particulars upon application. Address "R," care of Textile World Record, Boston, Mass.

MILL PROPERTY FOR SALE.

Suitable for Cotton or Other Manufacturing Industries.

Situated in a growing and prosperous Southern town. Two large railroad systems. Heavy brick building, best construction, slate covered. 30,000 feet floor space. Located on a canal where water power can be used or cheap electric power can be procured from plant nearby. Considerable capital will be contributed by people of town to right party who purchases the property and starts manufacturing business. For full particulars address PAUL GARRETT, Norfolk, Va.

January Numbers Wanted.

We should like to purchase several copies of January, 1905 issue of Textile World Record, to supply urgent demands and will pay 25 cents each upon receipt. **Mark plainly so that we may know to whom to send remittance,** or give credit on subscription account as may be desired.

LORD & NAGLE CO.,
299 Devonshire St., Boston.

Forelady Wanted

who thoroughly understands the finishing work on

High Class Ribbed Underwear.

Address "Forelady," care Textile World Record, Boston, Mass.

Dyer of Hosiery and Yarns, fast black and colors, wants position. Fast black silk finish a specialty. Address "C. A. V.," care Textile World Record, Boston, Mass.

Wanted, immediately, an experienced man who can adjust and knit underwear on Lamb machines. Lamb Knitting Machine Company, Chicopee Falls, Mass.

Wanted, two second-hand skein spoolers. Payne or Burnham make preferred. Stanley Mfg. Co., Adams Ave. and Church St., Frankford, Philadelphia.

Do You Want $20,000?

A hosiery mill fully equipped to turn out 300 dozen per day will be sold for that amount

Less than the Conservative Inventory Value.

Best of railroad facilities in New York State.
Help above average intelligence.
Good reasons why present owners should sell.
Every reason why energetic brainy man of practical experience should double his money in one year.
Are you such a man?

Address "OPPORTUNITY," care Textile World Record, Boston, Mass.

FOR SALE.

A 14 x 36 Corliss Engine, now running at Grundy's Mills, Bristol, Pa. To be replaced by larger unit July 1st. Apply to WALTER G. TATNALL, 1502 Real Estate Building, Philadelphia, Pa.

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IN CONNECTICUT, SUITABLE FOR ANY MANUFACTURING PURPOSE WOULD LIKE TO MEET PARTIES ENGAGED IN OR CONTEMPLATING ENGAGING IN A MANUFACTURING BUSINESS WITH A VIEW OF CONTRIBUTING THE SAME FOR CAPITAL STOCK IN SUCH BUSINESS. FACTORY IS ABSOLUTELY FREE OF INCUMBRANCE AND OWNED BY RESPONSIBLE PARTIES; SATISFACTORY REFERENCES FURNISHED AND REQUIRED.

ADDRESS "R. R." CARE OF TEXTILE WORLD RECORD, BOSTON, MASS.

Worsted Plant For Sale

Excellent French Worsted Drawing and Mule Spinning Plant.

Henry Isitt, - Bradford, England

FIRST-CLASS SUPERINTENDENT WANTED

FOR A LARGE KNITTING MILL,

located in the North. One possessing a high degree of executive ability; energetic and thoroughly familiar with the finishing of high priced goods. A good judge of stock and capable of purchasing supplies. Liberal salary to right party. Address "Superintendent A. I., care of Textile World Record, Boston, Mass.

Business Opportunity. Reliable and energetic young man, who can invest ten or fifteen thousand dollars, can secure the position of treasurer of a cotton manufacturing plant in the best and most delightful city of the South. Address Millman, care Textile World Record, Boston, Mass.

POSITION WANTED.

Foreman in finishing room in knitting mill, making ladies' and men's underwear. Have had several years' experience. Can furnish reference as to ability, habits, etc. Address "Finishing Foreman," care Textile World Record, Boston, Mass.

First Class Hosiery Dyer wants position. Twenty-five years' experience on fast black and aniline colors. Strictly temperate. Western States preferred. Address "Western," care Textile World Record, Boston, Mass.

SITUATIONS WANTED.

The following advertisements are a portion of those of superintendents and overseers of whom full particulars are on file at this office. Manufacturers who may be in need of such men may address them in care of Textile World Record, or state their requirements directly, and the addresses of suitable men will be furnished without charge.

Any paid in-advance subscriber may have his name placed on the list of those desiring positions, upon filling out the requisite blanks, furnished upon request. Correspondence is confidential.

Mr. C. T. Donlevy, a practical mill overseer and superintendent, who has a wide acquaintance with mill men, is now a member of the Textile World Record staff, and gives special attention to this department. He would be pleased to hear from any of his friends who may be interested.

COTTON SUPERINTENDENTS.

Superintendent or assistant of silk or cotton mill. Worked on plain and fancy ribbons and all classes of goods in broad silks, dress silks and tie silks, also Jacquard work. References. 3185, Textile World Record.

Superintendent or assistant superintendent cotton mill. Age 30; American, single. All kinds of cotton goods. Can take place at once. 3199 Textile World Record.

Superintendent of broad silk mill wants position. Age 39; English; married. Worked on mostly plain goods. Could be of good service to some reliable concern just starting up. Has small plant of his own which he would put in as stock with a first-class concern. 3154, Textile World Record.

Superintendent. Would like position in South. Not particular about salary to start. Machinist and thoroughly acquainted with all kinds of card room machinery, also spinning frames. Taken superintendent course in textile school and has had 23 years of practical experience in the mill, mostly on fine yarn work. 3044, Textile World Record.

Cotton Mill Superintendent, or assistant. Age 34; married. Worked on cotton machinery on coarse and medium numbers. Textile school education in designing, carding and spinning. 3003, Textile World Record.

Superintendent of cotton mill or overseer. Handled all kinds and numbers in yarn mills, cloth mills, colored warps, etc. Speeder, warper, spooler and spinner in the family. Age 48; American; married. 3219, Textile World Record, Boston, Mass.

Superintendent of Cotton Yarn Mill or duck mill. A young man; American; married. Prefers position in the South. Worked in different departments, spinning, spooling, twisting, warping, reeling and balling and now ready for a superintendent's place. Unquestionable references. 3087, Textile World Record.

Superintendent. All kinds of fancy cotton, white and colored, plain and fancy, jacquard and box work, also silks and worsteds. Would take good overseer of weaving position. 3120, Textile World Record.

Superintendent, or overseer of carding. Worked on combed and carded yarn from 20 up to 140, twilled sateens, lawns, sheetings and shirtings. English and American machinery. 3036, Textile World Record.

Asst. Superintendent or Overseer. 20 years' experience as overseer in both England and Scotland over combing, drawing, spinning, etc. Can work both long and short wools, get up all kinds of mixtures, instruct the shading of batches, etc. Has good references. 43 years of age. 3086, Textile World Record.

Superintendent of yarn mill or plain cotton weaving or assistant. 33 years of age; American. Worked on all classes of yarn up to 50s and plain weaving. Married. 3226, Textile World Record.

Cotton Mill Superintendent. Overseer of weaving on mule spindles. Worked on fancy lenos, jacquards, fancy lappets, plain, fine and coarse cotton goods. Age 36; French-American. 3232, Textile World Record.

Assistant Designer on cotton or assistant in the weave room. Worked plain twills, sateens and dobby cloth. Age 21; English; single. 3230, Textile World Record.

COTTON SUPERINTENDENTS.

Superintendency of cotton mill wanted by a thoroughly practical cotton manufacturer of over 20 years' experience. Age 38; married. Temperate. Good manager. Fully competent to obtain full production at minimum cost and maintain best selling qualities. Highest references given. 1236, Textile World Record.

Superintendent of cotton mill, spinning or weaving, assistant superintendent or designer or overseer of weaving, plain or fancy goods. Age 28; English; married; first-class references. 3243, Textile World Record.

Assistant Superintendent in an up-to-date cotton mill. Age 26 years. Textile school education. Single, hard worker and of good habits. Would invest in a paying proposition. 3239, Textile World Record.

Supt. of Cotton Mill, or overseer of mule or ring spinning is open to a position; 16 years' experience in Northern mills, on yarns, denims, awnings, apron checks, bicycle suitings, shirtings, etc., etc. Familiar with all well-known makes of cotton machinery; 39 years old; American; married. Can give references from large Massachusetts mills. 1537, Textile World Record.

Superintendent of cotton weaving and spinning mill. English. Quilts, damasks, brocades, ribbons, etc. 3175, Textile World Record.

Superintendent. Worked on ginghams and cotton warps of all kinds. Lowell, Whitin and Draper machinery. Age 41; American. Good experience. 3095, Textile World Record.

Superintendent or assistant. Leno, plain and fancy ginghams and sheetings. Wants place at once. 3162, Textile World Record.

Superintendent or Machinist. Age 36; English; married. Worked on underwear, ribbed and plain; sweaters, circular and flat; hosiery, circular and full fashioned. Will not go West or South. First-class recommendation. 3095, Textile World Record.

Assistant Superintendent, Chief or Mechanical Engineer. Age 38. Technical graduate. 15 years' practical experience in cotton and flax mill repairs and equipment, well acquainted with cotton, flax, tow and jute machinery, and detail construction of same, also with the installation of power plants and power transmission. Would make a first-class mechanical superintendent. Best of references. Prefer New England. 2068, Textile World Record.

Superintendent of bleaching. Worked on all kinds of lawns, lenos and colored lenos, towels, colored and white, ducks, drills, sateens, tickings. Age 55; English; married. First-class references. 3245 Textile World Record.

Superintendent of bleaching and finishing cotton goods. Worked on all kinds of cheese cloth, buttercloth, sheetings, quilts, cambrics, long cloth, ducks and drills. Age 31; English; married. 3218, Textile World Record, Boston, Mass.

Superintendent of cotton bleachery is open to a position. Excellent experience. American; married; aged 37. Familiar with cambrics, sheetings, shirtings, lawns, sateens, drilling and fancy weaves. 3153, Textile World Record.

WOOLEN SUPERINTENDENTS.

General Manager, agent, superintendent or designer. Worked on everything from fine worsted to a blanket. Good experience. Aged 37; American; married. 3172, Textile World Record.

Superintendent or Designer. Age 37; American; married. All grades of woolens and also cotton warp goods. Will not go South or to Canada. 3124, Textile World Record.

Asst. Agent, superintendent or mechanical engineer in woolen or carpet mill of any kind. Age 30; married. Excellent references. 3178, Textile World Record.

Manager, superintendent or designer. Age 30; English; married. Experienced in England and in this country. Mohairs, all classes of worsted suitings, plain and fancy dress goods. 3184, Textile World Record.

Superintendent of worsted yarn plant or overseer of drawing and spinning. Worked on Australian, English, domestic woolens, mohair, alpaca, spun from 8s to 70s, also carpet yarn. Age 38; American; widower. First-class references. 3221, Textile World Record, Boston.

Superintendent or boss weaver. 15 years' experience in worsted, woolen and silk goods. Graduate of Philadelphia Textile School. 32 years old; married. Good manager of help. American. 3119, Textile World Record.

Superintendent and Designer. Age 30; American; married. Cotton warp, worsted and silk vestings, tapestry curtains, plaid backs, broadcloth, etc. 3146, Textile World Record.

Woolen Superintendent. Worked on worsted ladies' dress goods, cassimeres, kerseys and meltons. Also a first-class man on fancy robes, bed and horse blankets. 48 years of age; married. 1598, Textile World Record.

Woolen Superintendent or designer. Worked on men's wear, worsteds, fancy cassimeres and ladies' dress goods. At present employed, but wishes a better position. 28 years of age; English, single. 3234, Textile World Record.

Assistant Superintendent. Worked on Woolens and worsteds of all kinds. Graduate of a Textile School. American; 23 years of age; single. 3228, Textile World Record.

Woolen Superintendent, manager or designer. Worked on worsted and wool combination, all wool, cotton mixed kerseys, overcoatings and ladies' dress goods. 46 years of age. 3235, Textile World Record.

Woolen Superintendent of small mill or assistant superintendent in large mills, or boss finisher, by practical mill man raised in the business. Worked through card room, dressing and weave rooms, and all the departments of finishing. Overseer 20 years; strictly temperate; have family; Scotchman. 3200, Textile World Record.

Woolen Superintendent and designer. Worked on men's wear, worsteds, fancy cassimeres, smoking jackets, over-cloth, ladies' dress goods. 28 years of age; English; single. 3234 Textile World Record.

Superintendent. A man now under engagement as superintendent in a first-class mill, desires to correspond with any party in want of a competent and reliable man. Experienced on all kinds of woolen goods and a good manager. Good reasons for changing. Correspondence confidential. Address, First Class, care Textile World Record, Boston, Mass.

Superintendent or assistant superintendent wants position. Age 31; American; married. Good experience on all kinds of goods, especially on union and satinets. Good references. Six years' experience in present place, five as overseer and one as superintendent. 3139, Textile World Record.

Superintendent of small woolen mill. Piece dyed goods, thibets, Venetians, meltons, etc. 3114, Textile World Record.

WOOLEN SUPERINTENDENTS.

Woolen Superintendent. Worked on nearly all kinds of men's wear and dress goods. Good experience as overseer and superintendent. Aged 51; American; married. 813, Textile World Record.

Superintendent woolen mill. Age 47; English; married. Wants New England or Middle States. 10 years' experience in first-class N. E. mills. 2028, Textile World Record.

Superintendent, manager or designer. Age 37; English; married. Worsted and woolen goods for men's wear and rain cloths. Worked in English mills, and has also been employed in this country. 3103, Textile World Record.

Superintendent, age 34; American; married. Worked on fancy woolens. Not employed, and can take position at once. Will not go to Canada or West or South. Would take a good boss spinner place or assistant superintendent, but wants over $4.00 per day. 3104, Textile World Record.

Superintendent. Was eight years in every department and acted as assistant in England. Wants to get a start in this country. Would take position as assistant superintendent, designer, or assistant designer. Has had experience on high grades of plain and fancy woolens and worsteds, as well as army kerseys and cotton worsteds. 1841, Textile World Record.

Superintendent or designer of small or medium sized mill. All kinds of fancy worsteds, cassimeres, cheviots, overcoatings and dress goods. Age 31; married; Scotch. 3076, Textile World Record.

Superintendent. Worked on cassimeres, unions, satinets, overcoatings, horse goods, bed blankets, linings, etc. Understands stock mixing, picking and figuring. Has had full charge of mill. 3074, Textile World Record.

Superintendent of large experience in the manufacture of woolen and worsted fancies and suitings, is open to an engagement as superintendent or designer. Age 45; American; married. Good references. 1982, Textile World Record.

Woolen Mill Manager, formerly of Yorkshire, is open to take a similar position in the United States or Canada. 1976, Textile World Record.

Superintendent or designer. Age 35; American; unmarried. Satinets, unions, fancy cassimeres, kerseys, worsteds. Good experience and references. 3058, Textile World Record.

Superintendent wants position. Worked on cassimeres, cloakings, unions, etc. American; married. 15 years' experience. References. 1674, Textile World Record.

Manager or Superintendent of a woolen mill, who understands designing, is open to an engagement. 34 years old; Scotch, and single. Large experience in Scotch and Canadian mills on tweeds, worsteds, overcoatings, etc. Good references. 1890, Textile World Record.

Asst. Superintendent. Young man, 26, graduate of Lowell Textile School (Woolen and Worsted Course). Has had considerable experience in setting up machinery, and worked in nearly every department of mill. Wants position in which there is a good chance to advance. 3040, Textile World Record.

Superintendent and Designer. All kinds of fancy cassimeres. Thoroughly competent and a man of good habits. First-class recommendation, and good experience. 2012, Textile World Record.

Superintendent or Designer. Age 37. English. Married. Experienced in this country and England. Worked on cloakings, suitings, coverts, broadcloths, etc. Mill closed, and wants place at once. Good references. 3140, Textile World Record.

COTTON CARDERS

Carder in Cotton Mill. Coarse or fine, white or colored, hosiery, Egyptian, etc. Age 35; Canadian; married. 3029, Textile World Record.

Overseer of Carding. Large experience on all kinds of work and both English and American systems. Can furnish first-class references. Had charge of carding in some of the best New England mills. 3009, Textile World Record.

Overseer of Carding or cotton ring spinning. Worked on carded and combed Peelers, Egyptian, and Sea Island cottons, making yarns from 8 to 80. 3015, Textile World Record.

Overseer of Carding. Has held all positions in picker and card rooms. White and colored goods, 8s to 40s. 3070, Textile World Record.

Overseer of Carding Mill. All kinds of fine yarns. Started up two of the largest card rooms in New England. Considered an expert in the manufacture of combed yarns from the bale to the finished article. First-class recommendations. 1745, Textile World Rcord.

Overseer of Cotton Carding. Worked on all classes of cotton, carded and combed, in counts to 135s. Will not go West or South. 3061, Textile World Record.

Overseer of Carding Department. Age 38; English; married. Plain and fancy goods; both combed and carded, Cotton Sea Island, Peruvian, Egyptian, Peeler, etc. Good references. 3196, Textile World Record.

Secondhand Carding or card grinding in a large mill. Worked on all white and colored goods, cotton from 4s to 70s. Good references. Age 29; German; unmarried. 3217, Textile World Record, Boston, Mass.

Overseer or secondhand in preparatory department of long chain beaming, quilling, tape dressing, warping and spooling. A Scotchman; married. Will not go West or South. 3156, Textile World Record.

Overseer of Cotton Carding. Worked on all classes of cotton, carded and combed, in counts to 135s. 3061, Textile World Record.

Overseer of Cotton Carding. Age 32; married. Carded and combed yarn, fine and coarse, lenos, lawns, shirtings. English and American makes of machinery. References. 3025, Textile World Record.

Overseer Cotton Carding or Spinning desires position. Age 47; American; married. Is familiar with all the modern makes of English and American machinery, revolving top flat cards, single and double carding. 2073, Textile World Record.

Overseer Cotton Carding. Age 35; married; 12 years' experience as overseer. Worked on all kinds of yarns from 10's to 150's, combed and carded, and is familiar with all makes of English and American machinery. 2075, Textile World Record.

Overseer of Carding. Age 32; American. Sheetings and prints. Wants New England only. Familiar with Lowell and Biddeford machinery. 3117, Textile World Record.

Overseer of Carding or Ring Spinning. Age 35; American. Sheetings, prin s and yarns, coarse and fine. Worked on most American machinery, but is more familiar with Lowell & Whitin. 1915, Textile World Record.

Overseer of Winding, filling, warping or spooling. Has had considerable experience in keeping mill books. Would consider position taking charge of shipping. American; age 26; single; good references. 3242, Textile World Record.

COTTON SPINNERS.

Overseer of Ring Spinning, spooling, long chain beaming, slashing and drawing-in. All kinds of fancies, sheetings, etc. $3.00 per day up. 3202 Textile World Record.

Overseer of Ring Spinning. Aged 42; American; married. Ginghams, sheetings, awnings, denims, etc.; $3 to $4 per day. 3018, Textile World Record.

Overseer of Cotton Mule Spinning. Understands Mason and English makes of mules. Has worked in mule room sixteen years, five years as second hand and a year and a half as overseer. 28 years old; married; steady and temperate. Would like to get work in N. E. or New York states. Has worked on colored hosiery yarn and filling. 1822, Textile World Record.

Overseer of Mule Spinning who has had a wide experience in large New England mills on yar ranging from 24's to 160's is open to a position. .. years old; American. Good references. 2003, Textile World Record.

Overseer of Spinning. Age 34; married. Good experience. 20s to 90s Egyptian and American cotton. 3125, Textile World Record.

Overseer Ring Spinning, spooling and warping wishes a position. A married man, with good experience. Worked on sheetings, shirtings, jeans, grain bags. 3152, Textile World Record.

Boss Ring or Mule Spinner. Age 43; English; married. Asa Lee mules, Lowell Machine Shop, Platt, Mason mules; Howard & Bullough, Lowell and Mason frames. Yarns from 5's to 90's. 3001, Textile World Record.

COTTON WEAVERS.

Overseer of Weaving. Good experience and reference. Worked on lawns, sheetings, sateens, dimities, fancies, etc. 3188, Textile World Record.

Overseer Cotton Weaving. Plain and a variety of fancies, lenos, etc. Good experience. A young man; English; married. 3147, Textile World Record.

Overseer of plain cotton weaving. Age 27; American; married. Familiar with Whitin, Mason, Colvin and Draper looms. Worked on prints, sheetings, cambrics, lawns, twills, etc. 3143, Textile World Record.

Overseer of Weaving. Worked on sheetings, twills, sateens and fancies. Wants not less than $18 per week. 3157, Textile World Record.

Overseer of Weaving. Englishman; 32 years of age; married. Worked on fine lawns, sheetings, sateens and fancies, coarse drills, twills, bicycle cloth, automobile cloth for tires. Familiar with Whitin, Crompton, Knowles, Mason, Kilburn & Lincoln and Lowell machines. 3073, Textile World Record.

Overseer of Weaving. Worked on all kinds of cotton goods, plain and fancy, including Turkish and cotton towels, also fancy worsted dress goods. Age 39; English; married. 3236, Textile World Record.

Overseer of Weaving or loom fixing. Worked on cotton, woolen, silk. Used to Crompton & Knowles looms, both box and plan, Lewiston looms, Mason, Colvin, Whiting, Patterson, etc. Age 43; Scotch; married. 3216, Textile World Record, Boston.

Overseer of Weaving or designer. Lawns, sheetings, twills, sateens, quilts, bedford cords, lappets. A young man; unmarried. Good experience and first-class recomendation. 3063, Textile World Record.

Overseer of Weaving. Accustomed to fancies. Can do own designing and figuring. Good references from past employers. Is open to go anywhere. Had experience on many kinds of looms, including the Draper. 1731, Textile World Record.

WOOLEN CARDERS.

Overseer of Combing, washing, carding. Age 36, English, married. All classes of wool. Good experience and first-class recommendation. 3094, Textile World Record.

Overseer of Woolen Carding. Would accept secondhand position. All wool, cotton and wool, shoddies, mixes, worsteds. Does not wish for position on shoddy, but would consider one. Blankets, suitings, flannels. Understands spinning. 3093, Textile World Record.

Carder and Spinner. Been overseer 32 years, making every variety of cassimere, flannels, overcoatings, cloakings, dress goods, etc. Married; American. 3132, Textile World Record.

Overseer of Carding. Age 30; American married; Nearly all classes of goods. Good experience and references. Address 3170, Textile World Record, Boston.

Secondhand in wool card room. Age 23; American. Wool and cotton mixes. References. 3198, Textile World Record.

Carder, or carder and spinner. Age 49; American. Has worked on all kinds of woolens, and of late on shoddy and cotton mixes. Is familiar with Davis & Furber machines. Excellent reference from past employer. 1944, Textile World Record.

Carder, or carder and spinner. German; married. Worked on all wool, wool and cotton, and shoddy mixes. Ten years' actual experience, and can furnish first-class recommendations. 2057, Textile World Record.

Overseer for Washing. Carding or Combing wool for worsted wants to better himself. Speaks German, French and English. Best of references. 2093, Textile World Record.

Second Hand of scouring and carding worsted in a large mill, or overseer in a small mill. Age 24; American; single. First-class references. 3246, Textile World Record.

Second Hand in Cloth Room wants position as overseer or second hand. 20 years' experience on all kinds of goods. Understands napping thoroughly. Good references. 3048, Textile World Record.

WOOLEN SPINNERS.

Roll Coverer wants an opening for work. Can cover cotton or worsted rolls, make aprons, or better, has had large experience. Can furnish tools Work by piece or day. 1803, Textile World Record.

Boss Spinner. Age 34; Scotch. Worked on all wool, cotton and wool and shoddy mixes. Will not go West, South or to Canada. References. Good experience. 3032, Textile World Record.

Overseer Woolen Spinning. Cassimeres, beavers, kerseys, dress goods, flannels, etc. Good experience. 3177, Textile World Record.

Boss Woolen Spinner. Would take a good secondhand job. Used to Davis & Furber and Johnson & Bassett machines. Worked on all kinds of goods. First-class references. 3215, Textile World Record, Boston.

Overseer of Warping, Spooling and Winding. Dress goods and cloth. Will not go to Canada Aged 40; married. Good experience. References 3027, Textile World Record.

Overseer in winding, spooling and thread dressing. Age 34; Scotch; married. Also had some experience in beaming. Shoe and corset lacing, plain and fancy braids and tapes, fine ginghams and dress goods. 3192, Textile World Record.

Master Mechanic in cotton or woolen mill or cotton finishing plant. American; married. Good experience and reference. 3189, Textile World Record.

WOOLEN WEAVERS.

Overseer of Weaving, also designer. Men's wear, woolen and worsted, and fancies of all kinds, cotton worsteds, dress goods. Knowles and Crompton looms. Age 35. 3056, Textile World Record.

Boss Weaver or assistant superintendent. Worked on all kinds of worsteds and woolens. Crompton & Knowles looms. Wants place at once. Middle aged; English; married. Good experience. Excellent references. 3062, Textile World Record.

Boss Weaver. Aged 38; married. Cassimeres, beavers, kerseys, dress goods, flannels, blankets. Worked on Crompton & Knowles broad looms. Good recommendation. 3066, Textile World Record.

Overseer of Woolen Weaving, or would take a secondhand job. 35 years old; married. Familiar with Crompton & Knowles looms. Good references. 3089, Textile World Record.

Overseer of Weaving or designer. Age 29; American; married. Thibets, meltons, kerseys, worsteds and cotton worsteds. Crompton & Knowles looms. Good experience. First class recommendation. 2051, Textile World Record.

Boss Weaver, second hand or loom fixer. Age 30; married. Wants $3 per day. Men's wear, dress goods and all kinds of fancy worsteds. Crompton & Knowles looms. Reference. 3182, Textile World Record.

Boss Weaver and designer. All grades of fancy dress goods, woolen and worsted, cotton and cotton mix kerseys, coverts and venetians. Plain and fancy men's wear. 3181, Textile World Record.

Overseer of Weaving. Worked on all kinds of fancy dress goods, cotton, worsted and woolen, also men's wear. Age 31; English; unmarried. 3159, Textile World Record.

Overseer of Weaving, or weaving and designing in first-class mill wants position. Will not go South or to Canada. $4.00 per day. Can furnish excellent references. 3056, Textile World Record, Boston.

Woolen Boss Weaver. Worked on worsteds, woolens of all kinds, also dress goods. American; 38 years of age; married. 3231, Textile World Record.

Woolen Boss Weaver. Worked on plain and fancy piece dyed worsted, woolen, plain and fancy flannels, also fancy mercerized rain cloths. 29 years of age; Canadian; married. First-class references. 3251, Textile World Record.

Overseer or superintendent. American. Married. Ginghams, madras, cheviots, dress goods. Good experience and first-class character. 3164 Textile World Record

Boss Weaver wants position. Very wide experience. White and colored, plain and fancy. Understands all kinds of looms. 335, Textile World Record.

Loom Fixer. Age 27. Knowles and Crompton looms. Wants not less than $2.25 per day. Will not go West or to Southern States. 3014, Textile World Record.

Second Boss or in advisory capacity for jacquard weaving. Familiar with almost every line of silk fabrics, also cotton backs, tapestry and upholstery goods, hammocks, table and bed covers, ribbons, etc. 3135, Textile World Record.

Loom Boss or asst. superintendent. All kinds of worsted goods for ladies' and gentlemen's wear and various classes of cotton goods. Worked in English mills and also in this country. 3151, Textile World Record.

A Young Man, 23 years of age, English, would like a position as assistant designer or boss weaver. Has worked on woolen dress goods, cloakings, suitings and worsted suitings. Good references. Moderate wages. Three weavers in family. 1997, Textile World Record.

DESIGNERS.

Designer on any class of dress goods, waistings, mantle cloths, fine shirtings, etc. 3203 Textile World Record.

Assistant Designer or asst. superintendent. Dress goods and men's wear. Age 25; Austrian; unmarried. Wants position in Philadelphia or suburbs. 3193, Textile World Record.

Designer on cotton, or assistant on woolen, worsted or Jacquard work. Age 31; American; unmarried. 3190, Textile World Record.

Designer in small mill or assistant in larger concern. Serges, cassimeres, shawls, and fancy worsteds and cotton goods. Wants only New England or Pennsylvania and New York. 3191 Textile World Record.

Designer. Age 29; American. Understands Jacquards and would like to get into a mill making ladies' dress goods, etc. 3186, Textile World Record.

Designer or superintendent. A German, 26 years of age. Dress goods and men's wear. Experienced in Germany and this country. 3163, Textile World Record.

Assistant Designer or assistant superintendent of woolen or worsted mill. A young man; American; unmarried. Men's wear, dress goods, silk brocades, damask, etc. 3160, Textile World Record.

Designer, woolen and cotton novelties. Used to fancy cassimere, ladies' dress goods, suitings and men's wear worsted, cotton and wool mixes. First-class references. Age 24; Scotch; single. 3212, Textile World Record, Boston.

Designer or boss weaver. Age 35; American; married. Worked on all kinds of worsteds, cheviots, men's wear, dress goods and coat linings. Used to Knowles and Crompton looms. First-class references. Can take position one week's notice. 3210 Textile World Record, Boston.

Designer or assistant designer. Worked on all kinds of sateens, fancy goods, dobbies and lenos. 21 years of age; American; single. First-class references. 3252, Textile World Record.

Designer, assistant designer or assistant superintendent. German. Woolen and worsted men's wear and ladies' dress goods. Experienced in Germany and a short time in this country. 3166, Textile World Record.

Designer or superintendent. Ginghams, crepe, jacquards, cycle tires, filter cloths, vesting cloth, etc. Good recommendations. Middle aged man; English; married. Address 3169, Textile World Record, Boston.

Designer. A young man who has had eight years of practical experience in cotton designing wants position as designer or boss weaver. Worked on Marseilles, crochet and satin bed spreads, table covers, ginghams of all kinds, including leno, lappet and all classes of the above. Jacquard work a specialty. 3107, Textile World Record.

Designer or superintendent. Age 37; English; married. Experienced in this country and England. Worked on cloakings, suitings, coverts, broadcloths, etc. Wants $30 to $40 per week. Mill closed, and wants place at once. Good references. 3140, Textile World Record.

Designer or assistant superintendent. Worked on cotton warp flannel coverts, plain and fancy cotton warp, and all wool dress goods. First-class references. 3244, Textile World Record.

Jacquard Designer wants position or temporary work. Prefers designing for Jacquard blankets if possible. 3167, Textile World Record.

Designer for cotton, worsted and silkoline dress goods and cotton trouserings, etc. A young man; American. 3173, Textile World Record.

DYERS.

Wanted. Position by First-class Dyer. Fifteen years' experience on raw stock, wool, cotton, shoddy, cross dyes and all kinds of piece dyeing. Age 35 years. Temperate and good manager of help. First-class references. Address Box 28, Textile World Record, Boston.

Boss Dyer and bleacher. Scotch. Good experience and references. Underwear. 3195, Textile World Record.

Boss Dyer in a 3 to 5 set mill, or secondhand dyer, Raw stock and shoddy. Wants Mass., R. I., or Conn. 3187, Textile World Record.

Boss Dyer in woolen mill. Would consider a good second hand job. Worked on broadcloths, dress goods, raw stock. Won't go South or to Canada. 3180, Textile World Record.

Dyer on all grades of worsteds, kerseys, broadcloths, knit goods of all descriptions, alpacas, mohair lining, ladies' dress goods, worsted yarn, cotton yarn, wool and cotton raw stock. Age 41; English-American. 3214, Textile World Record, Boston.

Secondhand Dyer. Yarn and cotton pieces. Experienced on all classes of goods on a small scale. Age 23; unmarried. 3171, Textile World Record, Boston.

Overseer of Dyeing on all classes of worsted, woolen and union goods. Can take position on two weeks' notice. Age 26; American; single. First-class references. 3224, Textile World Record, Boston.

Secondhand in dyehouse. Would accept a position as salesman. Worked in first-class worsted and woolen mills. Age 26; American; unmarried. Can take place on short notice. 3211, Textile World Record, Boston.

Overseer of dyeing and finishing, all kinds of worsteds, woolen, fancy mix, indigoes, and raw stock. 36 years of age; married. 3233, Textile World Record.

Secondhand Dyer. Cotton piece and cotton interwoven with paper. Experience with all classes of goods on a small scale. Aged 23; German descent; unmarried. Address 3171, Textile World Record, Boston.

Dyer or superintendent of dyeing and finishing. Age 34; English; married. Not less than $3.50 per day. All classes of woolen, worsted, mixed and cotton piece goods, bleaching, mercerizing. Can take charge from loom to case. 3121, Textile World Record.

Fancy Dyer. Aged 37; American; married. Cotton, wool and silk. 3158, Textile World Record.

Overseer of Dyeing. Men's wear and dress goods, loose wool, piece dyes and yarns. Good experience. 3161, Textile World Record.

Dyer. Worked on piece dyes, wool, cotton, shoddy yarns, rags and union dyes and carbonizing. Wants place at once. Good experience and references. 3092, Textile World Record.

Wanted, position as boss dyer and bleacher of cotton yarns, long and short chain and skein yarn. Good references. 3145, Textile World Record.

Boss Dyer. A young man; married; American. Worked on wool, shoddy, cotton, silk noils, rags, camel's hair and piece dyes on satinets. Will accept $2 per day to start. 3122, Textile World Record.

Boss Dyer. English; married; age 36. Eighteen years' experience on cotton and worsted skein, raw stock, woolen and worsted piece dyes, fancy men's wear, rain cloth, ladies' dress goods. Well up on all fancy shades. 1839, Textile World Record.

Dyer on cotton and woolen piece goods, yarn and fast black on cotton. Age 42; married. 3021, Textile World Record.

KNITTERS.

Foreman of Knitting Room. Age 29; American, unmarried. Fleece of all kinds and gauges. Balbriggan from 20 to 30 gauge. Flat work wool goods. Tompkin Bros. and Campbell & Clute machines. Will not go South. 3204, Textile World Record.

Secondhand knitter and fixer. Familiar with Lewis Jones, N. & T., S. & F., S. & W. and Brinton machines. Wants position at once. Ten years in present place. Ladies' and children's underwear and union suits. Will go anywhere. Age 28; unmarried. 3209, Textile World Record, Boston.

Superintendent of a knitting mill. Full fashioned seamless, worsted, merino, cotton, children's, misses' and ladies' hosiery and men's half hose. A fixer and one knitter and a looper in family. Age 41; German; married. First-class references. 3222, Textile World Record, Boston.

Knitting Foreman. Age 29; American; married. Worked on all kinds of ribbed underwear made on circular latch needle machines, all makes and gauges of latch needle machines, and slightly with Tompkins, Crane and Cooper latest spring needle rib machines. Can take place on week's notice. 3206, Textile World Record, Boston.

Foreman or assistant on spring needles. Worked on non-shrinkable woolen and worsted goods, fleece-lined, balbriggan and regular flat work. Used to Campbell & Clute and Tompkins machines. 30 years old; Irish and married. Can take position at once. 3205, Textile World Record, Boston, Mass.

Foreman. A young man of several years' experience as foreman knitter on single and double thread, flat goods, plushes and fleeces, wants a position of any kind where he will have a chance to learn latch needle knitting. No reasonable offer refused. 3038, Textile World Record, Baston.

Boss Knitter or machine fixer. Worked on plain lace and drop stitch hosiery. Good reference; 22 years of age; single. 3237, Textile World Record.

Boss Knitter or Finisher. German-American; single; age 22. Worked on tokes, skirts, globe mittens. Some experience with hosiery. 3240, Textile World Record.

Knitter. Worked on light and heavy weight ladies' ribbed vests and shaped vests, and all kinds of common knit goods. Familiar with Champion, Nye & Tredick, Star, McMichael & Wildman machines. Wants work in Pennsylvania. 3037, Textile World Record.

Boss Knitter or fixer. Would like to work with boss finisher on sewing machines. American; age 32. Familiar with McMichael & Wildman, Nye & Tredick, Snyder & Fisher, Scott & Williams and other makes of latch needle machines, Tompkins spring needle machines, and understands winding. 3118, Textile World Record.

Superintendent or Overseer in Hosiery Mill. All classes seamless hosiery. Understands Branson and Automatic ribbed toe machines. Also Pepper and 3/4 Automatic Excelsior. Age 49; good references. 1441, Textile World Record.

Superintendent or Assistant Superintendent in knitting mill, also cotton cloth mill or yarn mill. Age 48; married; first-class references. 3249, Textile World Record.

Overseer of Knitting Mill. Worked on all kinds of fleeced goods, balbriggan, and flat ribbed frames and latch needle frames. Age 30; married; good references. 3250, Textile World Record.

Boss Knitter or Machine Fixer. Age 22; American; single. Worked on plain lace and drop stitch hosiery. Good references. 3237, Textile World Record.

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We have built up the largest educational institution in the world, with an invested capital of 5 million dollars and with ¾ million students, by helping people to increase their earnings. This remarkable growth means that we have made a remarkable success of enabling people to earn more money. It is because we have helped so many thousands of others under all circumstances that we state positively that we can help YOU to earn more money. Do you want to raise your salary? It puts you under no obligation to find out how you can do so. Simply write us, stating the occupation you wish to rise in.

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FINISHERS.

Finisher and assistant superintendent wants position. Age 31; American; married. Good experience on all kinds of goods, especially on unions and satinets. Good references. Will not go West, South or to Canada. 3139, Textile World Record.

Boss Finisher. 25 years' experience on all classes of goods, woolen and worsted and cotton mixtures of all grades. 3142, Textile World Record.

Boss Finisher. American. Cheviots, cassimeres, beavers, dress goods, etc. Wants $2.50 to $3 per day. 3123, Textile World Record.

Boss Finisher or Secondhand wants position. Twenty years in finishing room; 8 years secondhand at three mills on woolens and worsteds. Good grinder. Good reference. Married; age 33. Strictly temperate. Address Finisher & Grinder, care Textile World Record, Boston, Mass.

Woolen Finisher. First-class. Familiar with all classes of goods and machinery. Can take full charge from loom to case. Has always been very successful. 1244, Textile World Record.

Overseer of Finishing Room. Cut and full fashioned balbriggan ribbed goods. Familiar with Union Special, Wheeler & Wilson, Willcox & Gibbs, Merrow, etc. Excellent references. Address 3168, Textile World Record, Boston.

Boss Finisher of underwear, cotton or wool mixed goods, who understands Wheeler & Wilson buttonhole machines, Union Button, Union Special, etc., is open to a position in the New England or Middle States. 30 years; American; married. Been employed for a number of years by concern for whom he is now working. Exceptionally good references. 1958, Textile World Record.

Overseer of Finishing. Age 32; American. Woolen and worsteds, suitings, coatings, cloakings, cassimeres, cheviots, meltons, frieze, etc. 2070, Textile World Record.

Drum or frictional winding is illustrated by several styles of machines, including those known as Coombs, Hetherington, Foster, Dobson & Barlow, Broadbent, Stubbs, Camless, Hill & Brown, etc.--these machines varying in structure but all producing a package having large, IRREGULAR SPACINGS into which the succeeding coils of yarn are PRESSED by contact with the FRICTION ROLL OR DRUM.

In FRICTIONAL WINDING, the tube or CONE HOLDER IS WEIGHTED so that it will rotate by CONTACT WITH THE DRUM AND WIND THE YARN AGAINST THE RESISTANCE OF THE TENSION. A full sized cone of yarn adds over two pounds to this pressure during the process of winding, making the pressure on the package that much greater at the completion of the winding.

In UNIVERSAL WINDING, PRESSURE is DECREASED as the cone increases in size and the yarn is not crushed or strained nor its elasticity impaired.

UNIVERSAL WINDING CO.,

95 South Street - Boston.

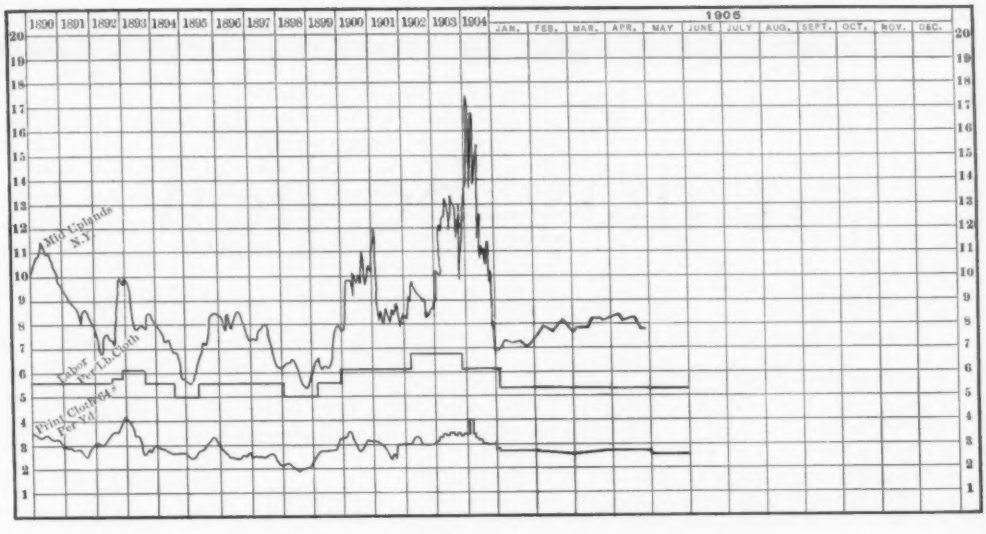

1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903 1904
1905
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
Mid Uplands N.Y.
Labor Per Lb. Cloth
Print Cloth 64 Per Yd

CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

Cotton Market.

There is no new feature to the market for cotton. Present supplies seem ample for all requirements. Visible stocks are large and it is believed that spinners on both sides of the water have taken advantage of low prices to fill their storehouses and thus guard against a possible shortage. The course of the market depends principally upon the new crop and it is too early to obtain any basis for predicting its side. The acreage is reported as slightly less than last year, but there is room for much doubt on this point as the planters have industriously sought to create the impression that the cotton area is greatly reduced. The large quantity of fertilizer said to have been sold this spring indicates a large acreage under cultivation. Weather conditions have been favorable, but the crop is somewhat later than last year. Cotton has been coming freely into sight, the total from September 1 to May 19 being estimated by the Chronicle at 11,501,014 bales. The same authority estimates the movement into sight for a series of years as follows:

From Sept. 1 to May 19.	Bales.
1904-05	11,501,014
1903-04	9,548,239
1902-03	10,158,664
1901-02	9,795,180
1900-01	9,613,284
1899-00	8,619,862

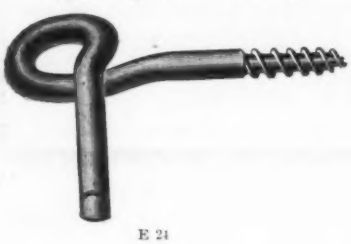
The world's visible supply on May 19 is estimated by the same authority at 3,980,008 bales; as compared with 2,672,603 bales in 1904; 2,890,289 bales in 1903, and 3,177,170 bales in 1902.

MITCHELL-BISSELL CO.

38 MURRAY STREET, NEW YORK.

PORCELAIN, ENAMELLED IRON AND GLASS FOR TEXTILE MACHINERY.

Right Angle Pontiac Guide.



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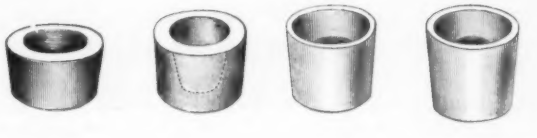

143 704 258 5219

Creel Steps.

E 8

It may be new

to you, but Wyandotte Textile Soda is not new to the many scourers of wool whose wool stock comes from the scouring vats in a free and lofty condition, and with none of its natural properties impaired.

Since Price is so closely joined with Quality, it is of the greatest importance to scour wool so that none of the life element is taken from the delicate wool fiber.

Wool scoured with Wyandotte Textile Soda comes out a snowy white, soft, lofty and odorless, and in perfect condition for carding and spinning.

Wool scoured with Wyandotte Textile Soda, when woven into cloth, produces a cloth of greater longevity than is common experience with cloth made from wool scoured with strong alkalies.

The usual detergent properties of Wyandotte Textile Soda, which enable it to do what other materials cannot do, are well worth consideration.

None Genuine except with a card bearing this Trade Mark

In Every Package.

There is no magic about this soda; it simply means progress in the process of wool scouring. Mr. Mill Man, is your business increasing or are you drifting? Stop, get out of the old rut, use Wyandotte Textile Soda. Order from your supply house or ask for further information.

THIS SODA WAS AWARDED THE HIGHEST PRIZE—GOLD MEDAL—AT THE ST. LOUIS EXPOSITION.

The J. B. Ford Co.,

SOLE MANUFACTURERS,

Wyandotte, Mich.

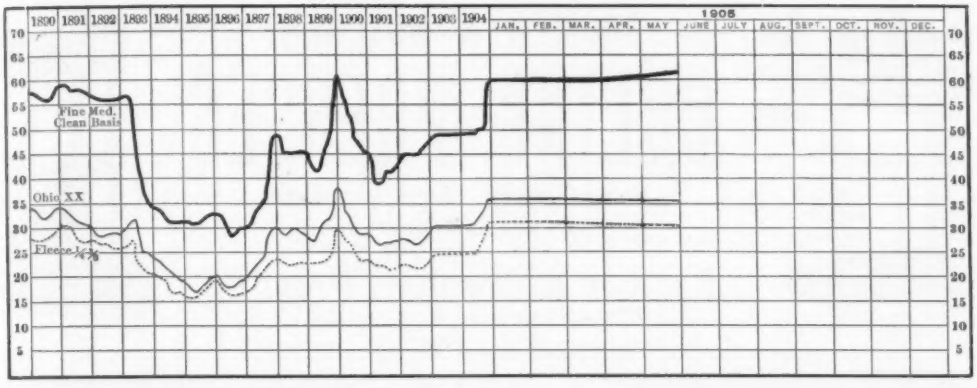

CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

Wool Market.

A demand far in excess of the domestic supply has raised wool prices for fine medium above the high mark reached during the boom of 1899-1900. The whole market has shared in the advance, which has back of it the substantial support of reduced stocks and a short supply. These factors were lacking five years ago when speculators pushed prices up, but were unable to support the load. Many were ruined in the subsequent decline. At the present time, however, conditions are very different. The rise is due to the law of supply and demand, and the trade has to a large extent reluctantly followed the upward course of the market. Very little of the new clip remained unsold at the completion of the shearing and the rapidity with which it has passed into the possession of spinners and Eastern dealers has probably never been equaled. The advance has caused more or less speculative excitement in the West where traders have bought and sold at a profit wool that they had not seen, and consequently neither they nor the final purchaser had any personal knowledge as to the condition of clean cost of the material. The frenzied trading has led many to stand to one side and let the market take its course. The only result of this attitude has been that the other fellow got the wool. It would not be surprising if in many cases the buyer found it necessary to take a loss later in the season.

The high prices for wool have stimulated imports, which for March amounted to 29,306,845 lbs., as compared with 18,088,787 lbs. in the same month last year. For the nine months ending March, 1905, the wool imports reached 167,722,962 lbs., against 115,978,963 lbs. for nine months ending March, 1904. The wool imports for the nine months just ended are at the rate of 223,000,000 lbs. per year, which is 50,000,000 lbs. above the imports of any year under the McKinley or Dingley acts, and nearly equal to the amount imported in 1896 under free wool.

Wool and Woolen Goods Made **NONSHRINKABLE**
by the use of "Nevershrink Process."
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STANDARD QUALITY COMBED RAMIE TOPS and NOILS a Specialty. **RAMIE YARNS in All Numbers for All Purposes.**

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Woolen, Worsted, Mohair, Ramie and Silk Knitting Yarns.

All Kinds of Yarn for Weaving Purposes. Special Fibres and Novelties for Woolen, Cotton and Silk Manufacturers.
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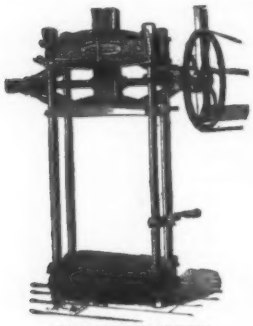

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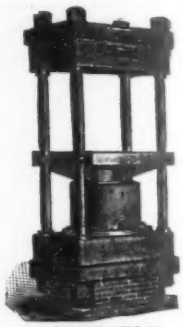

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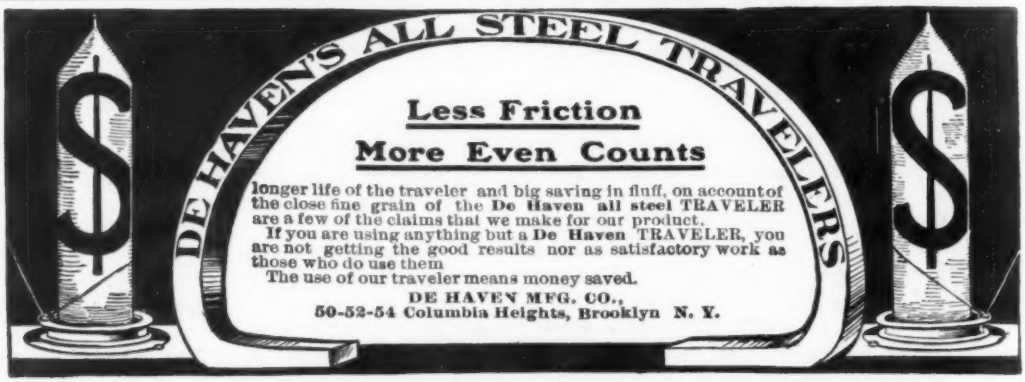
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longer life of the traveler and big saving in fluff, on account of the close fine grain of the De Haven all steel TRAVELER are a few of the claims that we make for our product.
If you are using anything but a De Haven TRAVELER, you are not getting the good results nor as satisfactory work as those who do use them
The use of our traveler means money saved.
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For Cotton Mills, Warehouses and Factories.

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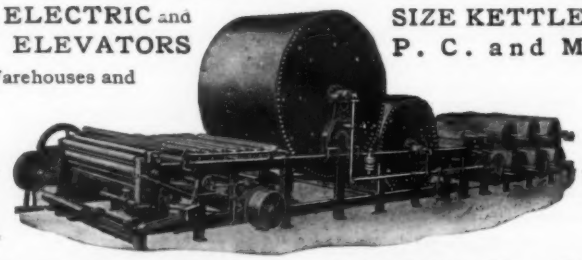

SIZE KETTLES. REPAIRS for P. C. and M. MULES and EMPIRE LOOMS.

WATERWHEEL GOVERNORS.

The COHOES IRON FOUNDRY & MACHINE CO., Cohoes, N. Y.

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Will Outlast Three Ordinary Valves.

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Pressure and Vacuum Gages. Pop Safety Valves.
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CROSBY STEAM GAGE AND VALVE CO.,

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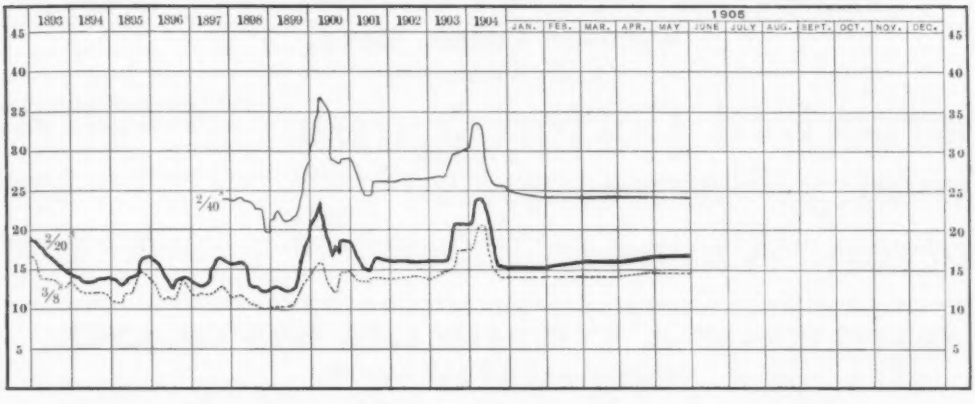
Office and Works: BOSTON, MASS,

Yarn Department.



GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

Eastern Yarn Market.

Prices have been extremely sensitive to every change in the raw cotton market. Both weavers and knitters have kept the business on a spot basis, and are operating as if a decline in the cotton market was assured. In this they may be disappointed as the price of cotton depends on the new crop. The consumption of cotton is going on at an unprecedented rate abroad, a short crop or one of moderate size would make a decline impossible, and it is in the face of such a prospect that consumers of yarn are buying from hand to mouth. With a large crop they win; without it—well, that is another story. This is the situation today. A feature of the yarn market that is worth noting is that prices strengthen with every rise on raw cotton, as easily as they weaken with every decline. We quote as follows:

Eastern Cops.

6's	15
8's	15
10's	15¼
14's	16¼
16's	16¾
18's	17¼
20's	17¾
22's	18¼
24's	18¾
26's	19¼
30's	20¼
34's	21¼
36's	21¾
40's	22¾

On cones, ¾c. more up to 14's; 1c. more from 15's to 22's; 1½c. from 23's to 35's, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

12's	17½
14's	18
18's	19½
20's	20½
24's	22
26's	23
30's	24
36's	25
40's	26
45's	29
50's	33
55's	37
60's	41

Eastern Two-Ply Warps, Carded Peeler.

2/30's	24
2/36's	25
2/40's	26
2/45's	29
2/50's	33
2/60's	41

Egyptian Weaving Yarns.
Single Skeins Combed.

30's	32
36's	33
40's	36
45's	40
50's	43
55's	46
60's	49
70's	59

Two and Three Ply Skeins, Combed.

30's	34
36's	33
40's	40
45's	43
50's	46
55's	49
60's	53
70's	61

Carpet Yarns.

60-yd. double reel filling	29
No. 2 60-yd. double reel filling	28½
1st quality ⅝	24
2d quality ⅝	23
60-yd. double reel filling skeins	10
(on cops)	11
120-yd. single reel cotton (on cops)	11
Wool ingrains, 42-yd. common	7
medium	8-8½
best	11½
extra best	15
light supers	18½
Super jute, 42 yard	7½
Super jute (light), 42 yard	7½-8
Velvet wool, spun, 135 yds., white	34
Gray	33

THE J. R. MONTGOMERY CO.,

Windsor Locks, Conn.

MANUFACTURERS OF

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools and Tubes. In Fancy, Twist, Colors and Printed.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

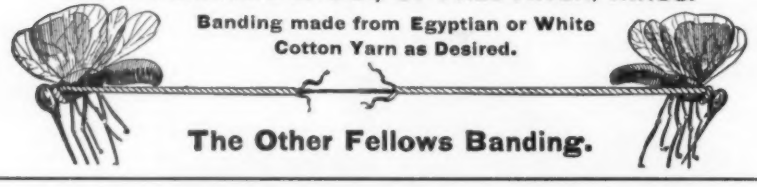
Colored and Bleached Yarns Furnished in any manner desired by the trade.

Pawtucket, R. I.

THESE MULES CANNOT BREAK THE BANDING —MADE BY—

M. J. TOOHEY & CO., OF FALL RIVER, MASS.

Banding made from Egyptian or White Cotton Yarn as Desired.



The Other Fellows Banding.

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double Twist

COTTON WARPS

HOUSATONIC, MASS.

4s to 60s.

Dana Warp Mills

WESTBROOK, ... MAINE

White and Colored Warps 6s to 50s Single and Ply

Mule Cops From 30s to 50s from American & Egyptian Cotton

Philadelphia Yarn Market.

Prices of yarns have been well maintained the past few weeks, and most mills are still busy on orders. Spinners generally, are well enough supplied with orders to stand firm for prices, when the soft spots develop in the cotton market. These have occurred frequently this spring, but they have only lasted a short time, and have not affected yarn prices, their only effect being to produce a dullness in business for a short time.

Single weaving yarns seem to be a little easier in prices and are not in such good demand as ply yarn. Stocks of yarn are low. Most all classes of manufacturers are running full time. Buyers are following the cotton market closely, and business has been good on each advance in the cotton market. There has been a sharp advance in Egyptian cotton and yarn has advanced in sympathy. We quote as follows, subject, however, to change from day to day and constantly strengthening:

Southern frame spun cones:—	
7's and Coarser	15
8's and 9's	15
10's	15
12's	15½
14's	16
16's	16½
18's	17
20's	17½
22's	18
24's	18½
26's	19
30's	19½-20
40's	25
50's	31
Southern high grade mule yarn:—	
Cones.	
10's	16
12's	16½
14's	17
16's	17¾
18's	18¼
20's and 22's	18¾-19½
24's	20
Southern frame yarn, lower grades:—	
6's and 8's	15
10's	15
Eastern cones (high grade quality):—	
10's	16½
12's	17
14's	17½
16's	18¼
18's	18¾
20's and 22's	19¼-19¾
Skein yarn (mostly Southern):—	
4's to 8's soft	15
10's to 12's	15½
14's to 20's	15½-16½
22's	16½
14/2	16
16/2	16½-17

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Successors to BUCKINGHAM, PAULSON & CO.
Commission Merchants
COTTON YARNS of all Descriptions
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302 Chestnut St., Phila. 210 Munroe St., Chicago, Ill.
Cash Advances, Cash Sales and Prompt Returns. Consignments and correspondence solicited.

JAMES E. MITCHELL CO., COMMISSION MERCHANTS.
Cotton Yarns
FOR ALL PURPOSES.
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Brown Building, 185 Summer Street, BOSTON, MASS.

CATLIN & CO.,
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Harding, Whitman & Co.,
Dry Goods Commission Merchants,
COTTON AND WORSTED YARNS.
BOSTON. NEW YORK. PHILA.
CHICAGO. BALTIMORE. ST. LOUIS.

A. D. SALKELD & BRO.,
With FRED'K VIETOR & ACHELIS,
YARNS.
66-72 LEONARD STREET, - NEW YORK.

Fred Sternberg & Co.
530 Broadway, - NEW YORK.
MERCERIZED TURKEY RED GASSED } COTTON YARNS.

E. D. LORIMER & CO.
COTTON YARNS } ALL NUMBERS
MERCERIZED YARNS } FOR ALL PURPOSES
346 BROADWAY, NEW YORK.

MOELLER & LITTAUER,
SILK, WORSTED, WOOLEN YARNS COTTON AND MOHAIR
Polished Threads and Tinsel. Artificial or Wood Silk, Mercerized, Turkey-Red, Fine Gassed Yarns.
109 GREENE ST., NEW YORK

CAPACITY, 30,000 Spindles. **ORSWELL MILLS** FITCHBURG, MASS.

COMBED **COTTON YARNS** CARDED

In Chains and Skeins, on Balls, Beams, Spools—Single or Twisted.

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Offices: 229 Chestnut St., Philadelphia.

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IN ALL COLORS

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Cotton Warps and Yarns. In Gray and all Colors, Single or two or more Ply, and Cable Cord.

Novelty Yarns. in Various Patterns, Colors and Twists.

Carded and Colored Cotton. For Mixing with wool. Machined or in Roving.

Indian Orchard, Mass.

F. MORGAN-PRES. H. B. WIGHT-TREAS. W. C. GODFREY-AGT.

20/2	17-17½
30/2	19½
40/2	24-25
16/3 slack	16½
12/3 slack	16¼-16½
8/3 carpet	15½
8/3 slack	15-15½
9/4 slack	15-15½

Warps (Southern):—

10's to 12's	15-15½
14's	15½
16's	16
20's to 22's	16½-17
26's	18
14/2	16½
16/2	16¾-17
20/2	17½
24/2	18
30/2	19½-20
40/2	24-25

Mixed colored yarns (mock twist, half colors):—

6's to 10's	16¼-16¾
12's to 14's	17½-18
16's to 18's	18½-19½

Mock Egyptian, 2c. advance over white.

Egyptian, 4c. to 5c. above best quality white.

Worsted Yarn.

The present is one of great danger for the spinner and no orders should be accepted unless they are covered by the purchase of wool. Spinners have secured some good orders at prices which show an advance of from 5 to 7 cents per pound over previous quotations. More orders would have been secured had the spinners been able to sell at old prices or prices previously quoted. All the spinners have advanced prices, and we hear of some failures of spinners who booked orders without covering for material.

We believe the weavers of men's wear goods do not know what they are up against. The following deal, which did not go through, will prove this: A certain spinner made a relatively low price on a certain lot of yarn. The weaver said he didn't think he cared to buy yarn at that time as he saw no occasion for an advance in price, but would decide definitely in a week. When the salesman went to report the result of the transaction to the spinner he found him in a very excited state of mind. The spinner told him he must not take the order at the price named, as since giving the price, which was but two days old, wool had advanced 8 cents per pound, and if the order was accepted, he stood to lose money. As a matter of fact spinners are throwing down orders right and left, and in some instances are accepting only half the orders offered. Spinners in quoting prices state that in the present condition of the wool market they will not hold prices open over night. Spin-

O. K. SOAP CO.
MANUFACTURERS
FINE TEXTILE SOAPS,
SILKINE,
AND LISLE SILK FINISH
For Fast Black and Colors. Softness and lustre.
Write us to-day.
968 North Franklin Street, - PHILADELPHIA.

LINEN YARN IMPORTER.
HUGHES FAWCETT, 115 Franklin Street, NEW YORK.
Flax, Hemp and Jute Line and Tow Yarns,
For Weaving Purposes.
Linen Jacquard Harness Twines,
Fine Cotton Harness and Heddle Twines,
For Cotton, Silk, Woolen and Carpet Manufacturers.
Correspondence solicited. Samples promptly furnished.

Mercerized and Plain
Skein, Warps,
Cones, Cops,
Tubes
COTTON YARNS
426 and 428
Market St., Phila.
Theo. H. Strouse & Co.

Ballou Yarn Co.
PROVIDENCE, R. I.
Harness and Seine Twines and other Job
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COMBED and CARDED
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240 Chestnut St., Philadelphia.
108 Franklin St., N. Y., with James Talcott.

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Office
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Worsted and Mohair Yarns—White or colors,
in skeins, on spools, cones, or shuttle bobbins.

Novelty Yarns—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making yarns only.

Genapped Yarns of all kinds. Doup Yarns. Harness Yarns. For Braids, etc.

DYERS OF YARN AND SLUBBING. BRISTOL, R. I.

French System. B. F. BOYER CO., Bradford System.

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EDDY & STREET,
Cotton, Woolen,
Yarns and Braids
Worsted, Spun Silk.
PROVIDENCE, R. I.

RICHARD CAMPION,

SELLING AGENT FOR

Bristol Worsted Mills,
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ABSOLUTELY PURE AND UNIFORM.

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AMMONIATED POTASH SALTS FOR SCOURING.

Dobbins' Palm Oil Fulling Soap. Dobbins' "Fast Black" Soap. Pure Olive Oil Potash Soaps.

FREE SAMPLE SENT FOR TRIAL ON REQUEST.

DOBBINS SOAP MANUFACTURING CO., 119 SOUTH FOURTH STREET, PHILADELPHIA, PENN.

Products for WOOLEN LINEN COTTON KNITTING and SILK MILLS — Sizings

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BOSTON, MASS.
Established 1870 Incorporated 1890

Softeners — BLEACHERS DYERS and CALICO PRINTERS' SOAPS

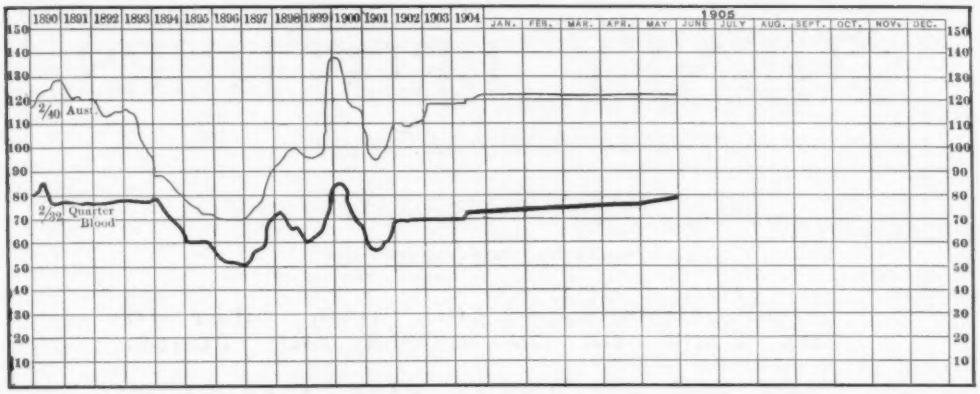


CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

ners will make prices and before they can be acted upon telegraph withdrawing them.

The dress goods manufacturers have been buying much 2-36s 3/8 and 1/4 Blood yarn. One very large spinner, who also runs a dress goods mill, has been obliged to purchase yarn outside of his own establishment in large quantities. The Pacific Mills of Lawrence have been unable to secure a proper amount of help and have had men parading the streets with a banner offering to employ all the help that applied. All the dress goods calls for 2/36s, and Panama cloth is the style which is using most of the yarn. These manufacturers are also using much yarn made one thread cotton and one thread worsted.

The men's wear weavers have been securing many orders for cloth requiring a cotton and worsted yarn, with a worsted filling, a manipulated fabric which has a smooth finish, a fancy weave, and is sold at a popular price. The mills making this cloth have been very busy and have bought much yarn. The prospects for the light weight season are good, although duplicates of heavy weights have been coming forward slowly.

We hear all kinds of reports from weavers. One weaver says that he made his great run on cotton worsteds, and although he had other kinds of cloth to make, yet he had been urged by his buyers to push all his looms on cotton worsteds and allow all the other orders to wait. On the other hand we have heard from weavers who state that they have secured no orders for cotton worsteds and

SILK NOILS AND SILK NOIL YARNS
In White and Colors.
A. T. SKERRY & CO., 47 Leonard Street, NEW YORK.

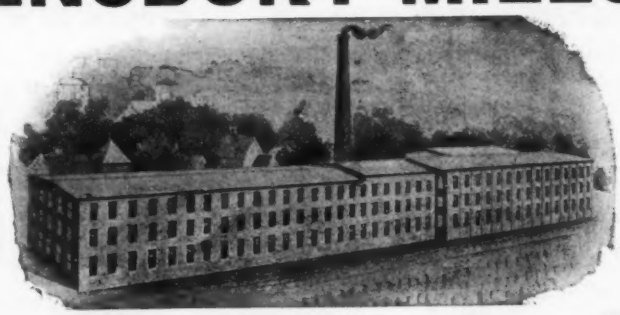
MOHAIR LOOPS, KNOTS AND FANCY YARNS FOR DRESS GOODS & CLOAKINGS.

QUEENSBURY MILLS WORCESTER MASS.

MOHAIR TOPS AND YARNS FOR WEAVING

LUSTRE YARNS FOR SERGE LININGS

ALPACA YARNS



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DRESS GOODS YARNS
KNITTING YARNS
WORSTED YARNS

MOHAIR

CHENEY BROTHERS,

Silk Manufacturers,

SOUTH MANCHESTER, CONNECTICUT.

TRAMS, ORGANZINE AND SPUN SILKS IN THE HANK, OR ON SPOOLS AND CONES.

SILKS FOR ELECTRICAL USES, INSULATION AND SPECIAL PURPOSES MADE TO ORDER.

KNITTING SILKS, RIBBONS AND PIECE GOODS FOR TRIMMING KNIT GOODS.

Pure Dye and Fast Colors Warranted.

WILLIAM RYLE & CO.,

Foreign and Domestic

Spun Silk Yarns and Noils.

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., NEW YORK.

SAUQUOIT SILK MFG. CO.,

INSULATING AND BRAIDING SILKS.

ORGANZINE, TRAM & HOSIERY SILKS.

Fast Dye Organzines for Woolen Manufacturers a Specialty.

Mills: Bethlehem, Pa., Phila., Pa., Scranton, Pa. New York Representatives, Wm. Ryle & Co., 54 Howard St.—Phila. Office, 4015 Clarissa St., Nicetown.—Chicago Office, 210 Monroe St.—Boston Office, 78 Chauncy St.

Crochet Lace Edgings

Spun Silk, Splicing Yarn, Mercerized Yarns, Cotton Warps, Sewing Threads, Tapes, Braids, Domets, Cambrics, Silesias. : : :

Write for Prices and Samples. **George W. Chapin** 229-231 Church St. PHILADELPHIA

that their entire run has been made on manipulated worsteds. Then again we know of a weaver who has been buying heavily of yarn and he declares that the trade the coming year wants worsted cloth and is willing to pay for it.

The men's wear trade is calling for the use of half-blood stock, with numbers ranging from 2/26 to 2/40s. The dress goods mills still call for 1/4 to 3/8 Blood yarn mostly in 2/36s. Some weavers not in touch with the market are surprised at this rapid advance, and the situation has changed from one of indifference to one of apprehension, and although no light weight orders have been booked weavers are trying to cover more or less on yarn. Spinners state that inside of 60 days yarn will be still higher.

Cotton twist yarn is going to be used largely the coming season and weavers are buying large blocks of this yarn for light weight business. French spinners continue busy, although they have been obliged to advance prices materially. Some are still working on low-priced contracts. The combers are busy, but prices are advancing as the wool situation is developed. The outcome of all this is in the future.

Quotations at time of writing are about as follows, but cannot be depended upon for twenty-four hours:

2/40s Australian	1.20
2/40s Delaine	1.20
2/36s 1/4 to 3/8 Blood	92 1/2-95
2/20s 1/4 Blood	70-80

Woolen Yarn.

Spinners continue busy, although some that have been running day and night for the weavers of men's wear during the past heavy weight season will be obliged to make arrangements for orders in some other direction. In this connection we note that certain weavers are willing to allow spinners to borrow their spinning space from week to week, but are unwilling to lose control of the space under contract. If the men's wear weavers are slowing down, the knitters are taking whatever space is open—and later the weavers will need much woolen yarn for imitation worsted effects in cloth which is manipulated with worsted and cotton yarn. The demand for men's wear is all for smooth cloth and the woolen yarn to be used will be to imitate worsted yarn in an endeavor to reduce the cost of cloth. Dress goods manufacturers later will use considerable woolen yarn to run with worsted and thereby reduce the cost of production. Many who buy woolen yarn delayed purchasing because they believed that in June or July wool prices would be lower and advised customers

JENCKES SPINNING CO.,
Formerly E. JENCKES MFG. CO.
Carded and Combed Cotton Yarns for Weavers and Knitters.
Double and Twist Yarns for Woolen Trade.
PAWTUCKET, R. I.

WILLIAM B. CHARLES,
Cotton Yarns,
Cotton Cloth,
Silesia, Sateens,
For the Underwear Trade.
AMSTERDAM, N. Y.

GRANT YARN CO.,
COMBED AND CARDED COTTON.
YARNS 40's and above. AND WARPS
FITCHBURG, MASS.

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of the
New England Thread Co.
CENTRAL FALLS, - - R. I.
(DYERS and BLEACHERS) and MANUFACTURERS of
High Class Threads on Tubes, Spools and Cones and MERCERIZED YARNS for Knitting.
GLAZING OF YARNS
For the Shoe Lace. TAPE and WEBBING TRADE.

C. MOORE & CO.,
Manufacturers of
TWINES, THREADS AND YARNS,
Jacquard Harness Twines of all kind on hand and made to order.
S.W. Cor. Fifth and Market Sts., Phila.

Knitting and Weaving YARNS.
Cones, Cops, Warps, Skeins,
Single, Double, Three-Ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.
EDWARD S. HYDE,
226 CHESTNUT STREET,
Philadelphia, Pa.

Of Two Evils, Choose Neither!

Don't use fluid oils, and oil your belts, your floors and your goods, as well as your bearings.
Don't use greases, which don't feed till the bearings grow warm, and leave a gummy residue behind, causing an increase of 25 or 30 per cent in the friction load.
Use **NON-FLUID OILS**, which don't drip like the corresponding fluid oils, nor inflate your coal bill like greases.
Our booklet tells why. May we not send it to you, with free samples to prove our claims? Better write to-day.

NEW YORK & NEW JERSEY LUBRICANT CO.,
17 Church St., New York City.

JOSEPH M. ADAMS CO.
WOOLEN YARNS,
Carpet Backing and Rug Yarns a Specialty.
ARCOLA MILLS,
Main St., foot of Centre St., Manayunk, Philadelphia.

YARNS Solis, Boston.
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SUMMER STREET.
ANDREW J. SOLIS, Jr. & CO.

HOFFMAN, DeWITT & McDONOUGH,
Manufacturers of
Diamond Stay Bindings TRADE MARK
Tapes, Webbing and Bindings.
COTTMAN and G STS., PHILADELPHIA
Ryer's Station, P. & R. R. R.
Bell Telephone, 203 Cheltenham.

Wiscasset Mills Co. | Patterson Manfg. Co.
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HIGH GRADE HOSIERY YARN
White and Colors. All Numbers.
Sewing Twines on Cones and Tubes.
SPECIALTIES IN WEAVING YARN.
Black and white. Double and twist for woolen trade.
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Woolen and Worsted
YARN DYER
Nos. 110 and 112 Turner St., Phila.

THE PEERLESS COMPANY,
Dyers of Skein Silk
FOR ALL TEXTILE PURPOSES
Willard and Jasper Sts., Philadelphia.
Pure Dye and Weighted. Bright and Souple.
Dyers of Peerless Black on Artificial Silk.

to hold off purchasing. Their predictions seem doomed to failure this time and many will be buying on a high wool market. There are many users of hosiery yarn that generally buy in June and their buying on the present market means that yarn prices will be 10 or 12 cents per pound over the prices last purchased. The chances are that a hand-to-mouth business will be the result.

The question is what is to be the outcome of these abnormally high prices. We give one instance which may show the trend. A certain buyer from a large clothing establishment wanted to buy covert cloth. He found that prices were advanced 25 cents per yard over the last purchased, and although he had intended to buy 50 pieces of cloth at a normal advance—he would not place a large order at the high price and bought just one piece. He said when that was gone he would buy another—and if his customers would not wait he would try to sell them something else he had in stock. His final observation was, that he did not care what he paid for cloth only he did not intend to have a big stock of high priced cloth on hand when the break came, and in any event the advance would finally come out of the consumer.

The manufacturers of eiderdown and French flannels are very busy indeed and have purchased much outside yarn. The rubber boot knitters will also be using much yarn. Some knitters purchased enough yarn for certain orders secured early in the season. The spinners took the orders but did not cover themselves on wool and consequently are making the yarn at a loss, but if these knitters secure reorders as they expect—much more will be charged for yarn, and as prices once made at the beginning of the season cannot be changed on reorders there is a chance for knitters to lose money also. We think many of the smaller mills have not placed orders for yarn which must be placed later and the same can be said of stock. Some of the knitters have taken orders thinking that prices would be lower.

The Government will undoubtedly place a further order for underwear in June as the last order placed was but a small one, and there has been no underwear purchased by the Government in quantities for two years.

The knitters are buying much Australian lambs' wool and thread waste, and it is conceded that this class of stock is the cheapest of all wool on the market today. This Australian lambs' wool has been sold carbonized for 76 cts. per pound and thread waste from 63 to 65 cts. and 70 cts. per pound, but it is undoubtedly a fact that this wool must advance on the present market because fine Nevada wool and Territory wool is being sold scoured for 75 cts. One large spinner and knitter who uses much

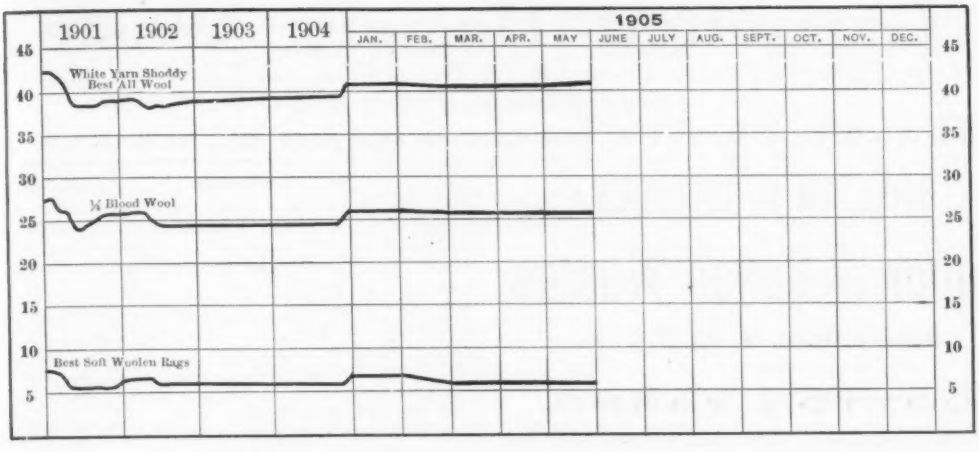

CHART SHOWING RANGE OF PRICES OF SHODDY, RAGS AND NOIL.

fine Nevada says that last year he purchased his Nevada on a basis of 58 cts. per pound without including scouring charges. This year for the same clip of wool the dealer asks 72 cts. per pound without including scouring charges. That shows an advance of 14 cents per pound and brings the wool from 14 cts. under the importing prices to exactly what Australian lambs' can be sold for. The result is that this spinner is going to use Australian lambs' wool and there are many others who this season will do the same.

Rag and Shoddy Market.

New rags are coming in rather more slowly than was expected by the trade and as a consequence prices are well maintained, although no general advance has taken place. The approach of the light weight season for goods makes dealers cautious about purchasing stock, although the boom in the wool market unquestionably places wool substitutes in a strong position. It is a growing opinion in the trade that the advance in wool has been carried too far, and is now beyond the prices which the wearer of woolen goods will or even can pay. Shoddy and cotton are the alternatives of high priced wool. Where warmth is a prime requisite wool shoddy is the only substitute, but the skill with which cotton is now made into fabrics that take the place of wool goods has done much to reduce the consumption of shoddy. For this reason it is not likely that the price of wool substitutes will advance in proportion to the increased cost of wool.

The shoddy market is dull as buyers are operating cautiously. Shoddy mills are fairly well employed in filling old contracts but new orders are coming in very slowly. Concessions in prices would probably result in an increase of business, but in view of the strength of the rag market shoddy manufacturers cannot see their way clear to make any reduction.

We quote as follows:—

SHODDIES AND EXTRACTS.

White yarn, best all wool	38-40
White knit, all wool, best, fine	28-32
White knit, No. 2	23-25
Light yarn, extra fine	25-28
New pure indigo blue	23-25

Merino.

Fine light, all wool, No. 1	24-25
Medium light, all wool, No. 1	16½-17½
Medium light, all wool, No. 2	14-16
Fine black, all wool	20-22
Fine dark, all wool, best grade	20-21
Medium dark, all wool, No. 1	13-15
Medium dark, all wool, No. 2	12-13
Red knit stock, strictly all wool	19-20
Red flannel, all wool	19-20
Dark blue for hosiery, strictly all wool, No. 1	17-20
Dark blue for hosiery, not all wool, No. 2	12-14

DELAINE EXTRACTS.

Light	19-22
Medium light	15-17

WOOLEN RAGS.

Regular gray	12-13
Black	14-15
Fancy colors	16-20
Fine merchant tailors, all colors	9-11
Choice light colors	13-15
Browns	12-13
Blacks	9½-10½
Fine blues, plain	9-11
Fine dark	10-11
Medium dark	7-8

Worsteds.

Blue	16-18
Black	18-20

Serges.

New black	15-16
New blue	14-15

Garnetted Hosiery Waste

In Cotton, Cotton and Wool Mixes, and All Wool. White and Light Colors a Specialty.

SEND FOR MONTHLY PRICE LIST.

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WILLIAM B. CHARLES,

Cotton and Cotton Wastes

Amsterdam, N. Y., U. S. A.

COTTON YARNS.

Contracts made with Cotton and Woolen Mills for Yearly Waste Production. Correspondence solicited. Shepperson's Code, 1878. Cable Address "Charles."

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WM. H. H. SLACK & BRO.,
Springfield, Vt.

Carbonized Stock a Specialty. **FLOCKS**

M. B. SCHWAB, Pres. H. RAWITSER, Treas.
ED. GLUECK, Sec. and Gen. Mgr.

RIVERDALE WOOLEN CO., MANUFACTURERS OF

.. Shoddies ..

Of every description. Capacity 7,000,000 pounds per annum. Custom Carbonizing and Garnetting a Specialty.

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C. M. BLAISDELL, Pres. and Treas. G. A. BLAISDELL, Vice-Pres. and Secy.
Established 1860—Incorporated 1893.

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COTTON, EGYPTIAN PERUVIAN

American Long Staple a Specialty. Shipments direct to mill from Egypt, Peru and all American Southern Points.

CHICOPEE, MASS.

Cotton Waste Purchased on Yearly Contract from Mills.

Has stood the test of years in Textile Mills

WARREN'S PULLEY COVER.

It allows belts to run slack without slipping. Saves power, belts and bearings. Any careful man can apply it. Is very economical and durable.

Sufficient for 40 sq. ft., $5; 125 sq. ft., $12.

If your supply house does not sell it, order direct.

The Warren Co., Mfrs., 192 Orleans Street, Chicago, Ill.

Flannels.

New scarlet	18½-22
New blue	17-18
Cloakings	3-4

SOFTS AND KNIT STOCK.

Soft woolens, best	7½-8
Old white flannels	14-16
White flannels, No. 2	11-12
Old red flannels	9½-10
Light blue flannels	7½-9
Old blue flannels	6-7
Fine worsted, new black	26
New blue clip, best, fine	20-22
Dark mixed yarn, extra fine	22-24
All wool yarn, medium and coarse grades	15-20
Old plaids	5-7
White stockings	17-18
White hood stock	20-21
Clear hoods	9-10
Red stockings	9-10
Blue stockings	7-8
Fancy stockings, No. 1	7-9
Gray stockings	9-10
Black stockings	9-10
Knit stock comforters	6-7½
Red knit	9-10
Light gray knit	9-10
New light fancies	16-18
New fancies	12-14

Merinos.

Light, fine	13½-15
Light, coarse	7½-8
Fine, dark	12-13
Dark, No. 2	8-9
Coarse, dark	6-7
Blue	12-13
Blue—seamed	13-14
Black—unseamed	12-13
New black	18-20
Small	3¼-4
Bunting	6-8

FLOCKS.

Shear, fine white, all wool	9-11
Fine indigo blue, all wool	9-9½
Fine black, and blue, all wool	7-8
Fine dark, all wool	5-6
Gig, fine, all wool	3-4
No. 1 black, all wool cut	6-7
All wool, fancy, shear and gig	2½-3½

COTTON WASTE.

No. 1 Spinners	7-7½
No. 1 Machine	6-6½
No. 2 Machine	4½-5¼
Machine Cop	6½-7
No. 1 Cop	6¾-7¼
No. 1 Card	7-7½
No. 2 Card	6½-6¾
No. 1 Oily Card	4¼-4¾
No. 2 Oily Card	3-3½
Peeler Combing	7½-7¾
Egyptian Combing	8
No. 1 Linters	4-4½
No. 2 Linters	3½-4

White Clips	6¼-6¾
Colored Clips	5-5½
No. 1 Picker	3½-4½

Dyestuffs and Chemicals.

Acids.

Acetic, 100 lbs.	2.60-4.05
Citric, domestic	34½-35½
Oxalic	5.00-5.10
Sulphuric, 60 deg., 100 lbs.	1.10-1.30
Muriatic, 18 deg.	1.50-1.60
Tartaric crystals	29-29½

Miscellaneous Chemicals.

Acetate of lime, gray, 100 lbs.	2.35-2.40
Alum, lump	1.75-1.80
ground	1.85-1.95
powdered	3.00-3.25
Aqua ammonia, 16 deg.	3¾-4
Ammoniac, sal., gray	5¾-6
Borax, bbls.	7¾-8
Brimstone, crude, foreign ton	21.00-21.25
Copperas	52½-65
Cream tartar, crystals	23½-23¾
Fuller's earth, lump, 100 lbs.	80-85
powdered	80-85
Glauber's salt	25-45
Potash, chlorate, crystals	8¼-8¾
powdered	8¾-9
carbonate	4-4¾
Soda ash, carbonate, 48 per cent.	1.25-1.50
high test	1.00-1.25
Soda, bicarbonate, English	3.50-6.00
American	1.30-1.70
Soda, caustic, domestic, 60 per cent.	1.85-1.90
Sal. English	85-90
Sal. American	60-70
Sulphate, alumina	¾-1¼
Vitriol, blue	5-5.15

Dyestuffs.

Acetate of soda	3¾-4
Acid, picric, best crystals	22-28
tannic, commercial	35-37
Albumen, egg	45-65
blood	21-25
Alizarine, red	15½-16
Aniline oil	10⅛-10½
salt crystals	8¾-9
Antimony salt, 65 per cent.	10¼-11
Bichloride of tin, 50 per cent.	9¼-9¾
60 per cent.	12½-12¾
Bichromate of potash, American	8½-8¾
Bichromate of soda	6½-6¾
Bisulphate of soda	1-1½
Cutch, mat	4½-6
boxes	5-8
Dextrine, imported	6½-7½
corn	2.35-2½
Divi-divi ton	35.00-40.00
Flavine	23-40
Fustic, stick, ton	18-20
young root	31.00-35.00
Gambier	4¼-4¾
Hypo. of soda, Am. bbls. cwt.	1.50-1.60
Indigo, Bengal, low grade	52½-55
medium	60-65
high grade	75-85
Kurpah's, medium to good	47½-60
Gautemala	35-70
Manila	43-45
Madras	42-45
J. (Synthetic)	18-20
Indigotine	95-1.80
Logwood, stick, ton	15.00-19.00
roots	14.00-16.00
Madder, Dutch	7-10
Muriate of tin, 36 degrees	9-9¼
52 degrees	15-15¼
Nitrate of iron, commercial	1¼-1½
Nutgalls, blue Aleppo	24-25
Persian berries	7-8
Phosphate of soda	1.90-2¼
Prussiate of potash, yellow	13½-13¾
Quercitron, ton	18.00-20.00
Starch, corn, pearl, bbls.	1.80
corn, pearl, bags	1.65
potato	3½-4
rice	6½-7½
wheat	5-6
Stannate of soda	12-20
Sumac, Sicily, No. 1, ton	42.00-47.00
Sicily, No. 2, ton	40.00-42.00
Tapioca flour	1.90-2¼
Tin crystals	22-23½
Turmeric, Bengal	3¼-3½
Zinc dust	5½-6

The Cotton Manual

By J. T. Broadbent.

of the Bradford-Durfee Textile School, Fall River, and formerly of the Mississippi Textile School.

This little Manual was prepared with the idea of telling briefly, but comprehensively, the things about the cotton fibre, its cultivation, and the ginning and marketing of the cotton crop, the different kinds of cotton, and other matters bearing on raw cotton, such as the average student or person connected with cotton manufacturing or the sale of cotton goods, wants to know.

There are excellent chapters on cotton baling, describing the different kinds of bales and baling processes, and on the opening and mixing of cotton in the mill, with account of different machines employed, and improved methods of mixing.

The book contains about 100 pages with 20 illustrations, and should be in the possession of every person having to do with cotton in any state, from the seed to the retail purchaser.

Price 75 Cents.

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For Mills, Dyers, Bleachers, etc., from 10 to 200 Gallons capacity.

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The following letter recently received explains the latest addition to the select list:

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THE PRINTERS' INK PUBLISHING COMPANY,
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PUBLISHERS OF PRINTERS' INK A JOURNAL FOR ADVERTISERS ESTABLISHED IN 1888. ISSUED EVERY WEDNESDAY $2 PER YEAR.

May 10, 1905.

Publisher of Textile World Record,

299 Devonshire St., Boston, Mass.

Dear Sir:-

In the 1905 edition of Rowell's American Newspaper Directory, appearing next week, only three publications were accorded the Gold Marks during the 1905 revision and yours is one of the three.

In this connection I call your attention to the enclosed page from Printer's Ink for May 10th.

An editorial reference to the above fact will appear in Printer's Ink for May 17th.

Yours truly,

THE PRINTERS' INK PUBLISHING CO.

.....

1 Enclosure.

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PICKING, CARDING, COMBING AND SPINNING, WARP PREPARATION AND WEAVING, DESIGNING, KNITTING CHEMISTRY AND DYEING.

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Oldest in America . . . Most Complete in the World.

Endorsed by the leading Educators and Manufacturers.

Cotton, Wool, Worsted and Silk

Instruction given in Designing, Weaving, Carding, Spinning, Chemistry, Dyeing and Finishing.

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Day Classes open October 2nd, 1905.
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Special Courses in Textile Chemistry and Dyeing.

For illustrated Year book and other information, address

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Capital Wanted in Textile Plant.

LOCAL people have $65,000 subscribed and want to interest $35,000 additional to construct cotton mill. Location desirable, having good supply of cotton and labor, and in healthful district.

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M. V. RICHARDS,
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COTTON MILLS

and all kinds of textile industries would be a great success at a number of cities and towns in the excellent cotton growing sections of the South and Southwest, tributary to the

FRISCO SYSTEM

First-class inducements, such as free sites, bonuses, subscriptions to stock, etc., will be given by a number of cities and towns to secure this class of industry. It is a well-known fact that cotton grown in Indian Territorry and Oklahoma is equal to the very best, owing to its long staple and superior quality. Natural gas in abundance is also available in a number of sections and could be utilized in running cotton and knitting mill machinery.

Send for copy of "Opportunities" giving full information relative to openings of all kinds of industries, factories, etc.

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Industrial Commissioner
FRISCO BUILDING, ST. LOUIS.

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Manufacturers of

MERCERIZED YARNS

FOR ALL PURPOSES.

MERCERIZERS AND DYERS.

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PROVIDENCE MILLS COMPANY,

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OF ALL CLASSES OF LINEN GOODS.
Toweling and Damasks a Specialty.

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Does the Best Bleaching at the Most Reasonable Rates?

TURKISH TOWELS, SKEIN YARN, TAPE, UNDERWEAR.

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DYERS, BLEACHERS AND **MERCERIZERS**

OF COTTON WARPS AND SKEIN YARNS.

Globe Bleach and Dye Works,
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We are Dyers of all kinds of YARNS Cotton AND Warps

We are sure we can give you better work and better service that you can get elsewhere. A trial will convince.

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ESPECIALLY FOR THE **KNIT GOODS TRADE**

YARNS BLEACHED AND DYED (delivered on cones)
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Dyers and Finishers of Dress Goods, Men's Wear and Cloakings, such as Venetians, Armures, Soleils, Crepons, also Silk Warp Fabrics, Cotton Warp Linings, Suitings, Clays, Serges, Worsted Damasks, Tapestries and Shirtings.

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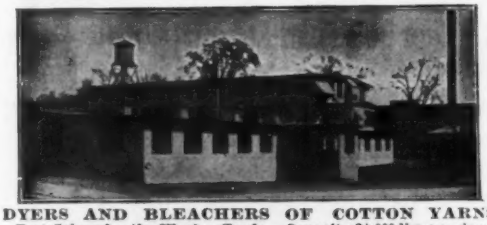

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Fast Colors for the Woolen Trade. Capacity 20,000 lbs. per day.

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Pawtucket Dyeing and Bleaching Co.

Bleachers and Dyers of COTTON YARNS and STOCKINET

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BLEACHING, DYEING AND MERCERIZING

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FOR WOOL, COTTON, WOOL AND COTTON MIXED

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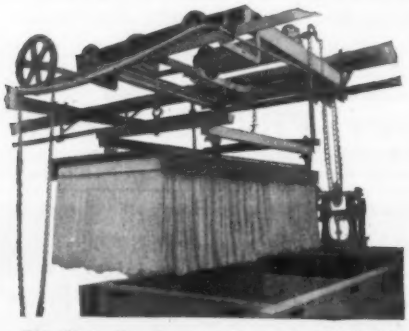
Absolutely free from Mineral Oils, Saponifies Perfectly, Odorless, Pure White and Stainless. Washes out Perfectly and Easily. Great Economy Guaranteed in its Use. Write for samples, prices and full particulars

The EXCELSIOR WOOL OIL COMPOUND CO. - - - - CINCINNATI, OHIO.

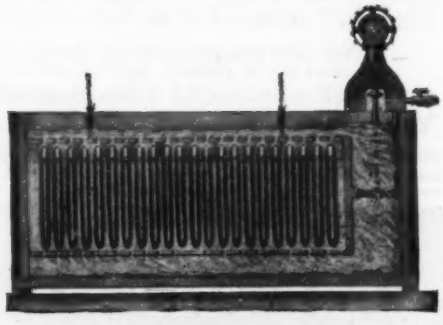
The Hussong Dyeing Machine

Patented Nov. 6, 1900. April 9, 1901. Nov. 29, 1904.

A PERFECT SKEIN DYEING MACHINE



This illustration shows our Compressed Air Hoisting Carriage, with 300-pound Yarn Machine suspended.



Longitudinal Sectional View, showing the circulation of dye-liquor through the yarn when in operation.

Points of Superiority Which We Claim for the Hussong Machine.

Durability, Even Dyeing, Saving of Steam, Saving of Dyestuff,
Saving of 75% in Labor. Makes No Waste Whatever. No Friction on the Material,
Requires but Little Power to Operate,
Leaves the Yarn and Slubbing in its Natural Condition.

Built by the **American Dyeing Machine Co., Office 609 Pearl St., Camden, N. J.**

BEWARE OF INFRINGEMENTS.

THE COHNEN

CENTRIFUGAL

Dyeing Machine

U. S. Patent 776,295, Nov. 29, 1904.

Dyes Raw Stock
or
Yarn in Cops, Skeins or Bundles (Warps)

DYES SULPHUR COLORS
without bronzing or streaking and leaves the stock in perfect condition for carding or weaving.

ONLY ONE HANDLING
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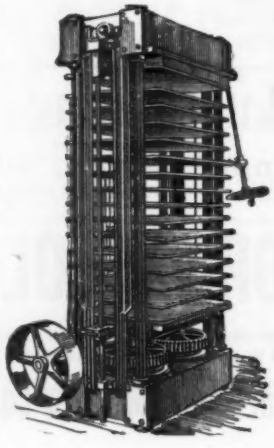

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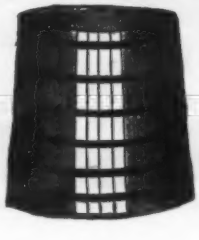

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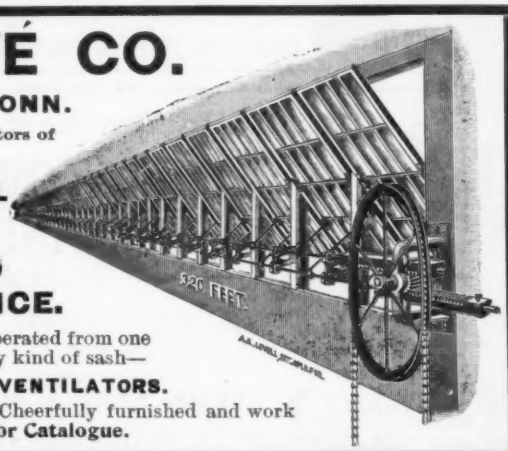

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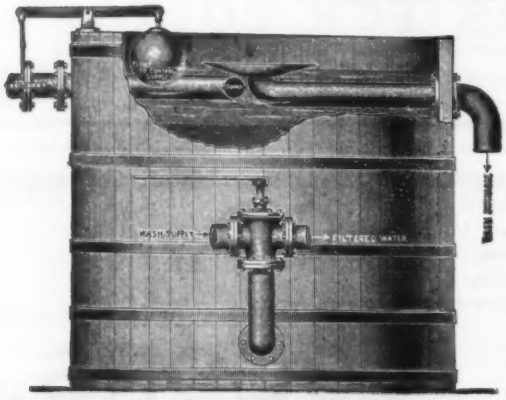

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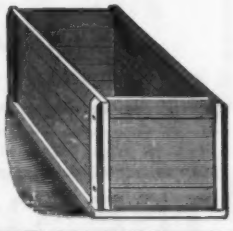

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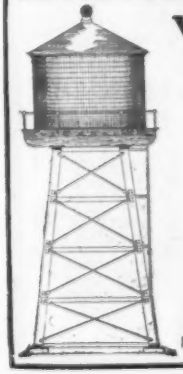

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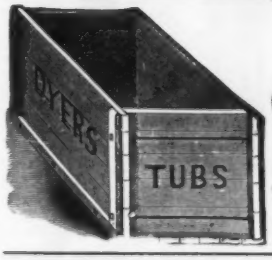

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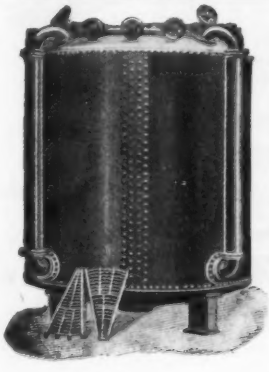

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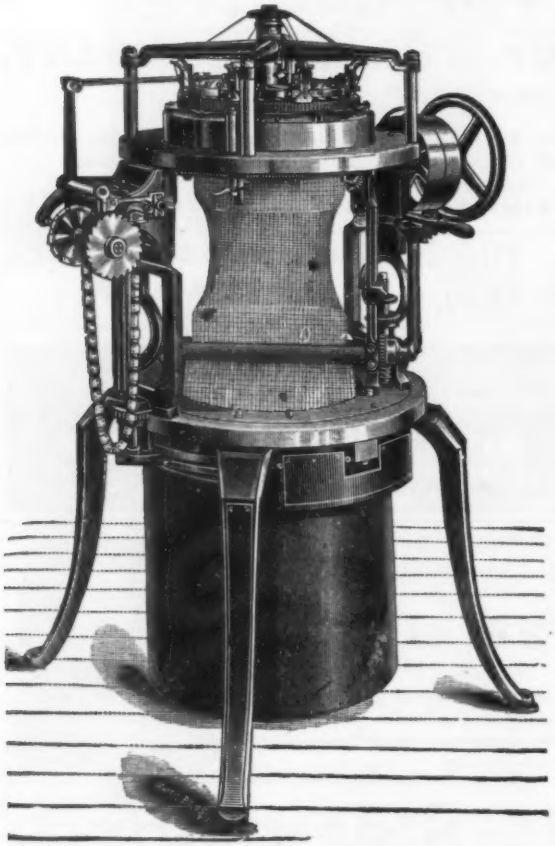

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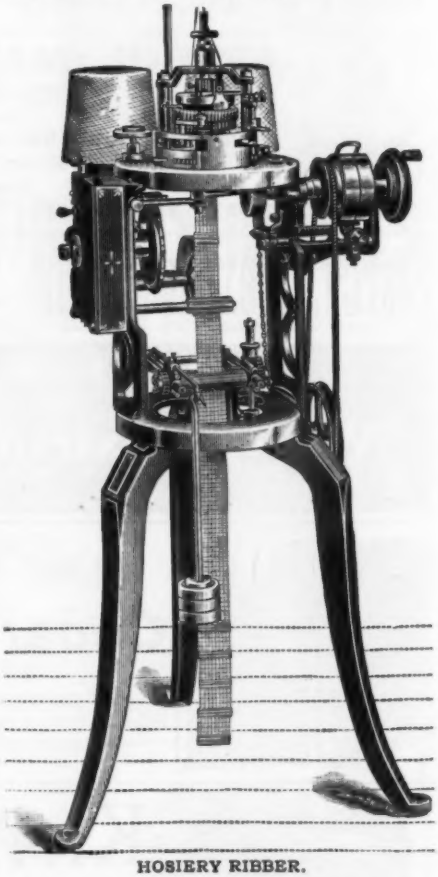

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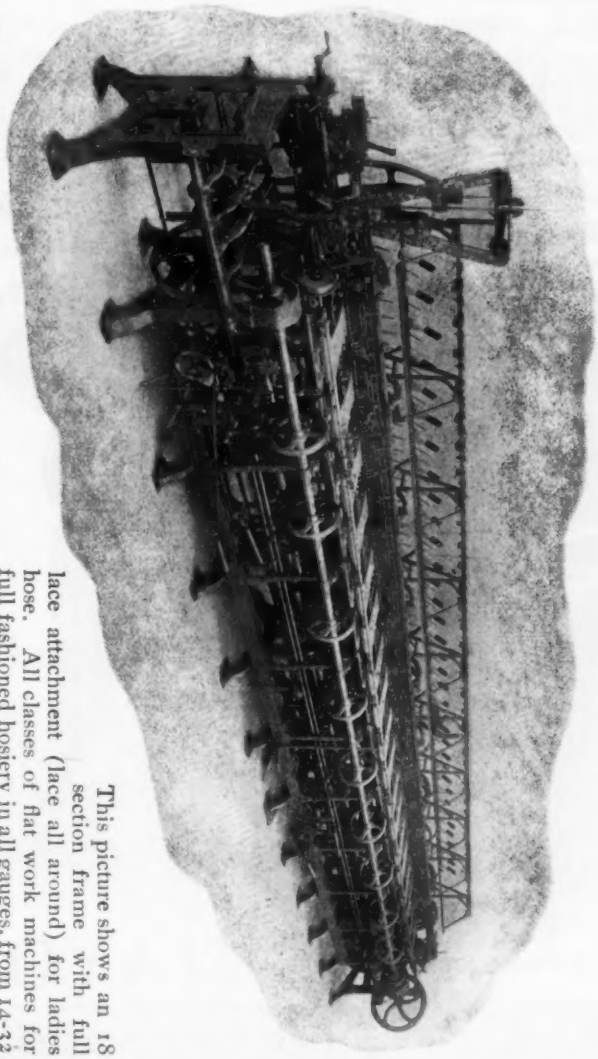

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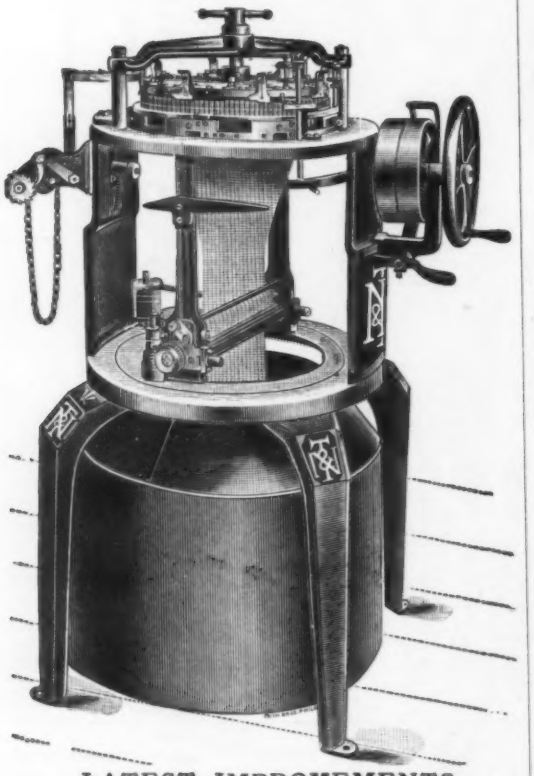

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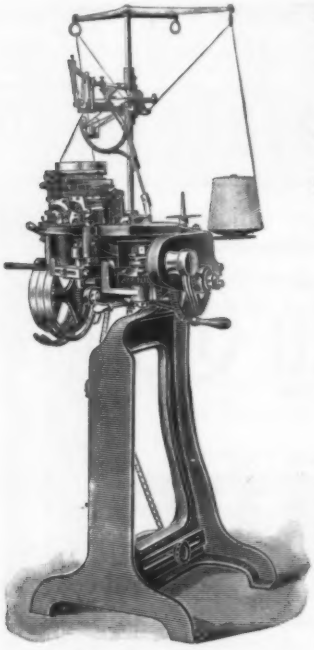

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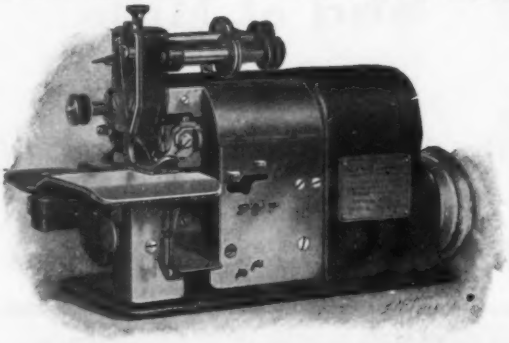

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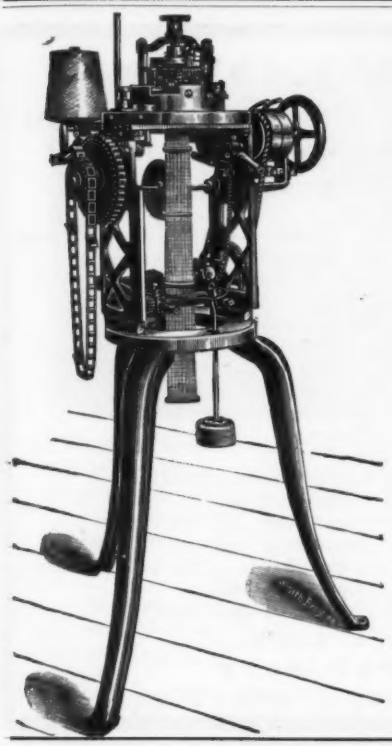

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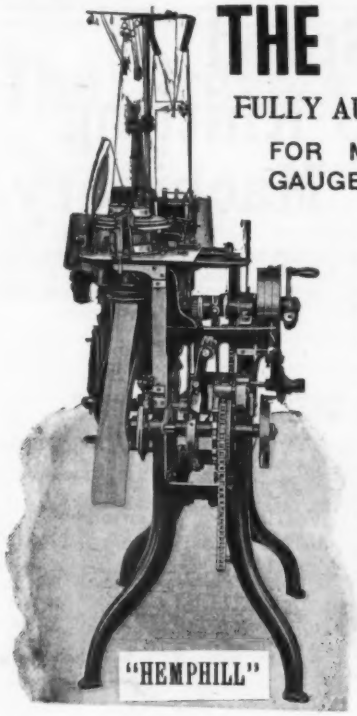

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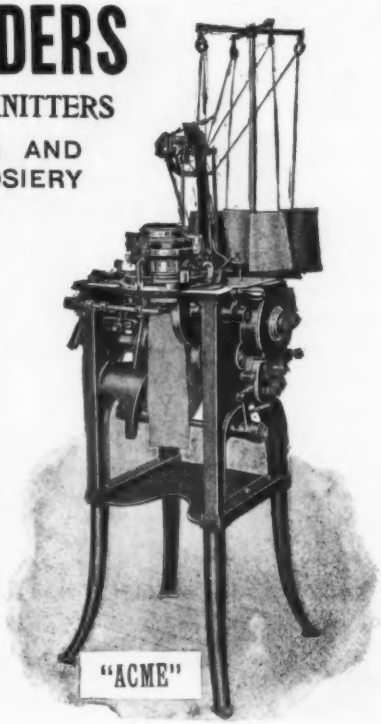

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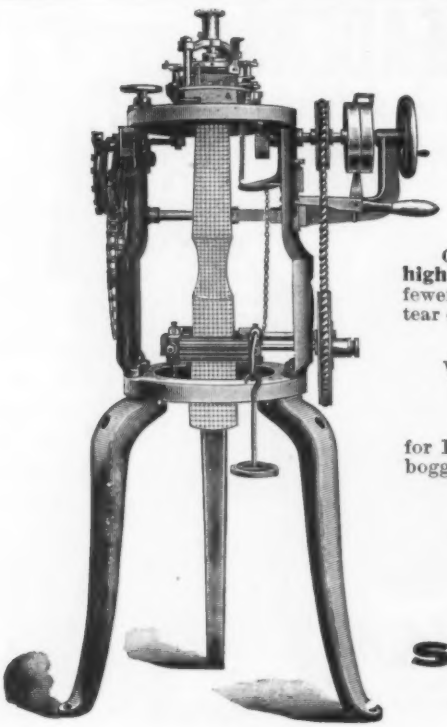

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The United States Court of Appeals in Philadelphia, which is the Court of last resort, on Feb. 13th, 1905, decided in our favor, the suit against Morris Starrels of Philadelphia for infringement of our patent No. 669,011 dated Feb. 26th, 1901, for Flat Knit Caps or Tam O'Shanters and Art of making the same. The claims of our patent for making brushed knit tams, thus sustained are broad, and as a number of other manufacturers are also infringing, we have been compelled for our own protection to enter suits against them.

Our counsel will push these suits vigorously and are instructed to move for injunctions immediately to stop further infringements of our claims, which we have sustained after tedious and costly litigation.

All persons are, therefore, warned against the manufacture of these goods by methods which infringe the claims under our patent under penalty of immediate legal proceedings.

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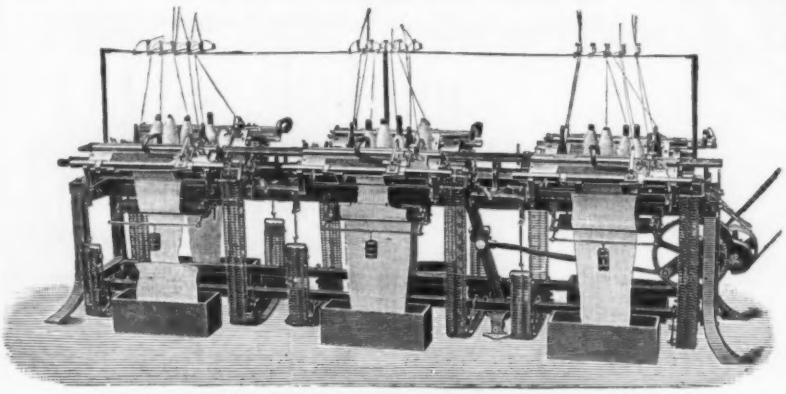
The *"Grosser"* full automatic Power Machines are always the ***cheapest,*** because ***they are the best.*** Special constructions for any kind of flat knit goods. Large Production. Machines easy to operate. The Grosser Jacquard and Shaker Machines have the best success in the market. Ask for descriptive Catalogue, Samples and particulars. ***Power Machines*** to ***be seen in Operation.*** Demonstration Rooms, Repair Shop. Largest and best assorted stock in ***Hand Knitting*** Machines, parts, needles and supplies. Promptest delivery. Special Machines for fancy gloves to be operated by girls.



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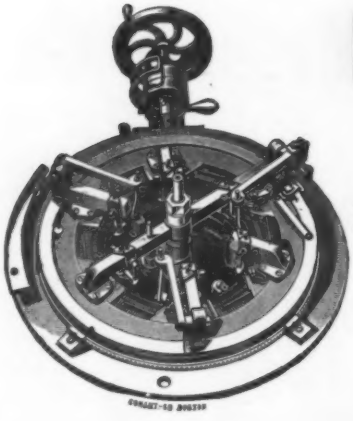

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Either plain or full automatic, with stop motions complete. 4 to 24 feeds for

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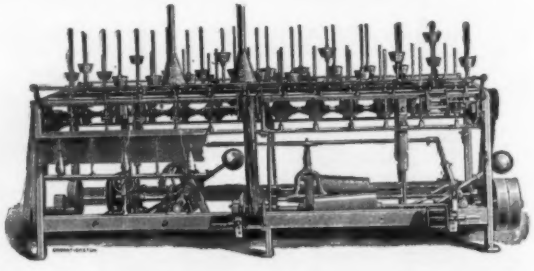
Automatic Racking and Striping Machines for Sweaters, Cardigans, Collarettes, Cuffs and Anklets.



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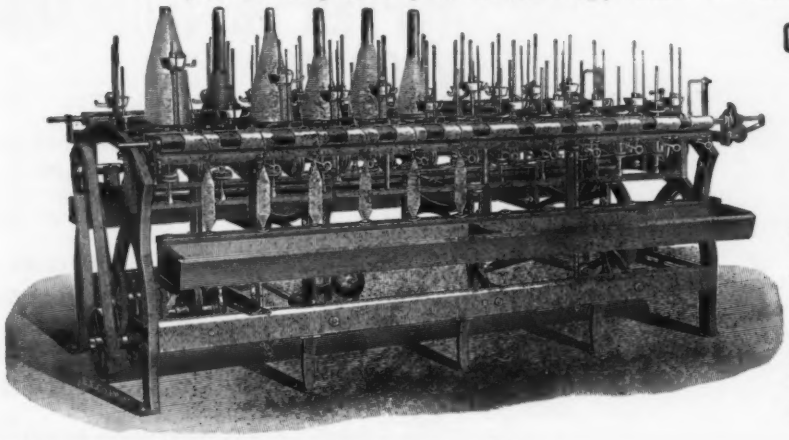
OVER 1,650 PAYNE WINDERS IN USE

For Hosiery Mfrs., Wind for Cop, Skein or Bobbin.



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"Awarded Gold Medal at World's Fair, Paris, 1900,

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COTTON SYSTEM, newest construction. The new machine knits the entire hose or half hose complete down to the toe, it makes French heels and French feet.

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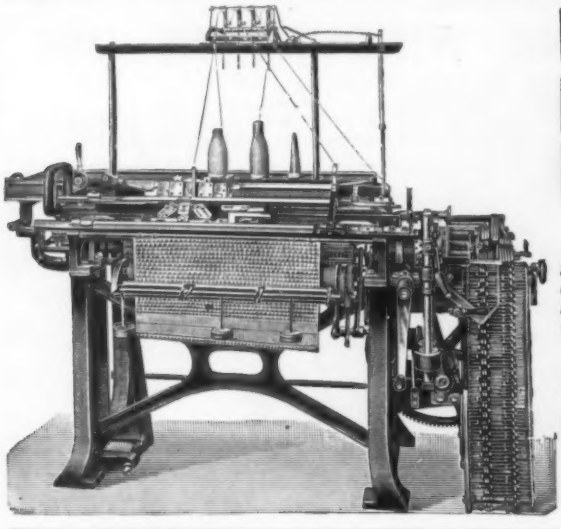

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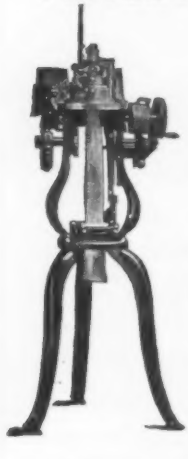

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The New Improved

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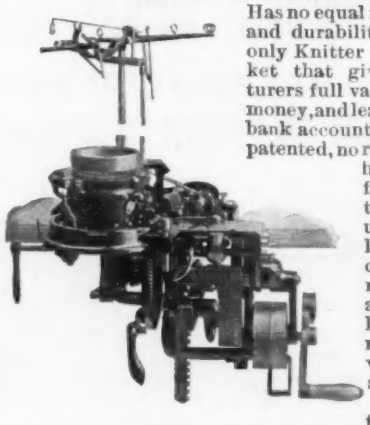

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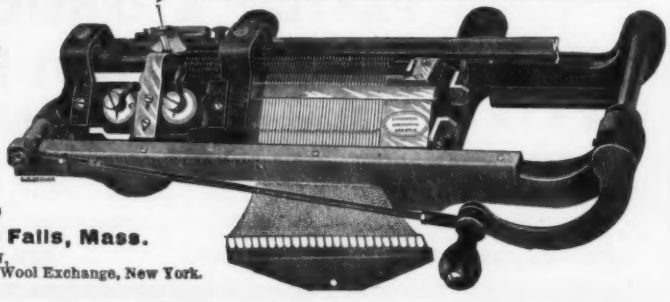

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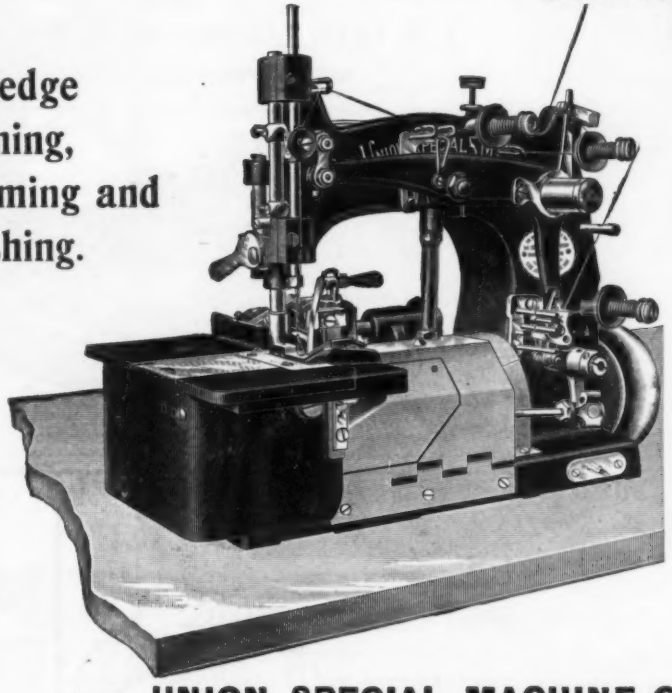

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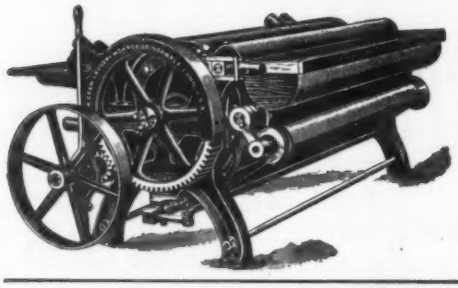

This machine irons and presses ribbed and flat underwear, giving a fine, smooth finish and most attractive appearance to the goods, not to be obtained in any other way. It does not break buttons. Inexpensive and easy to operate, and has large capacity. Knitting mills using them are greatly pleased with results. This method of finishing is sure to come into universal use. Send for further particulars to

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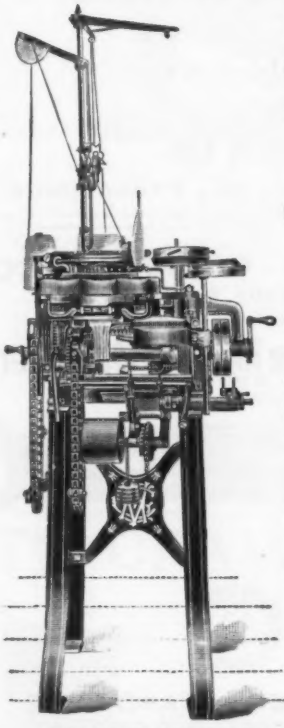

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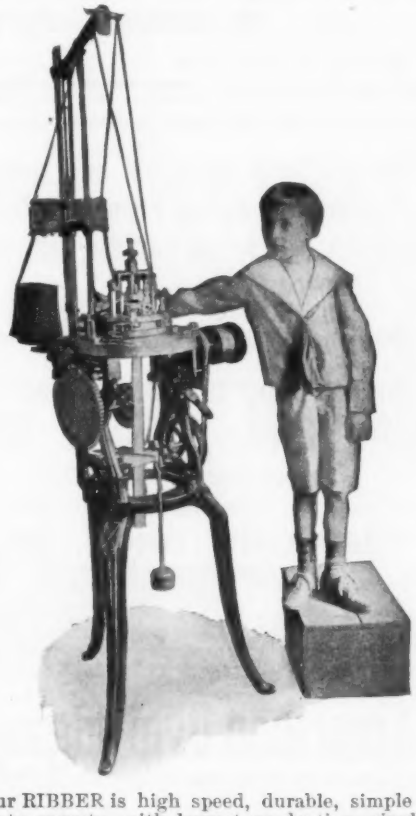

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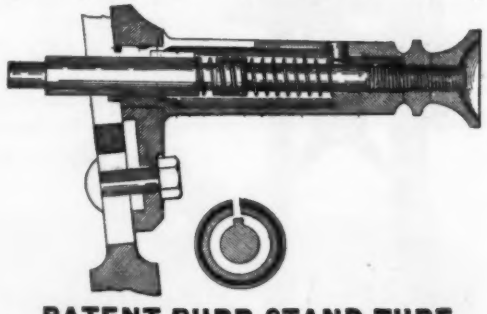

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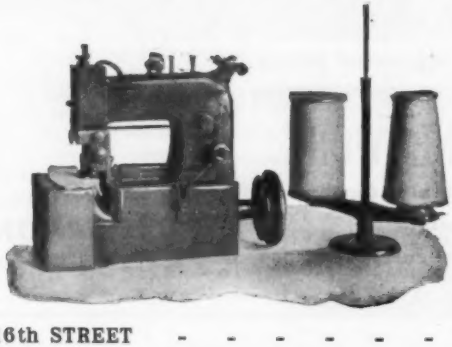

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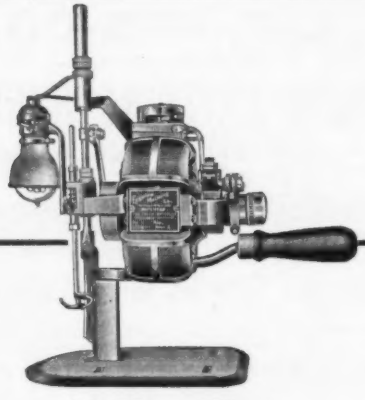

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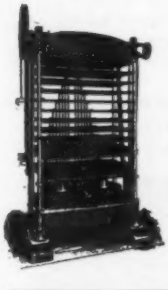

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IMPROVED CONSTRUCTION
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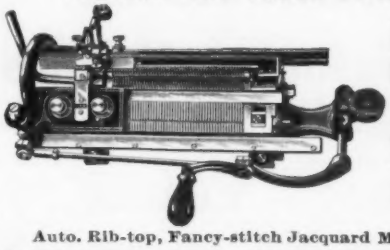

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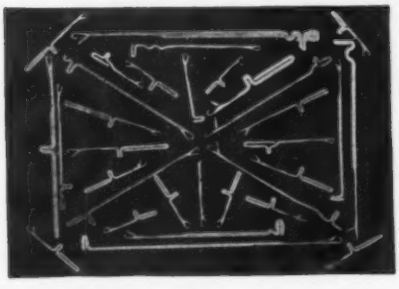

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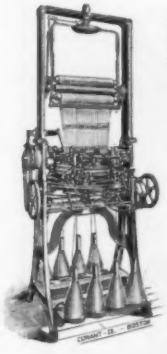

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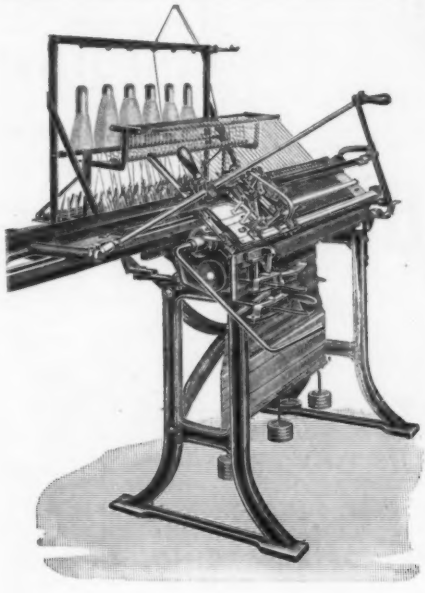

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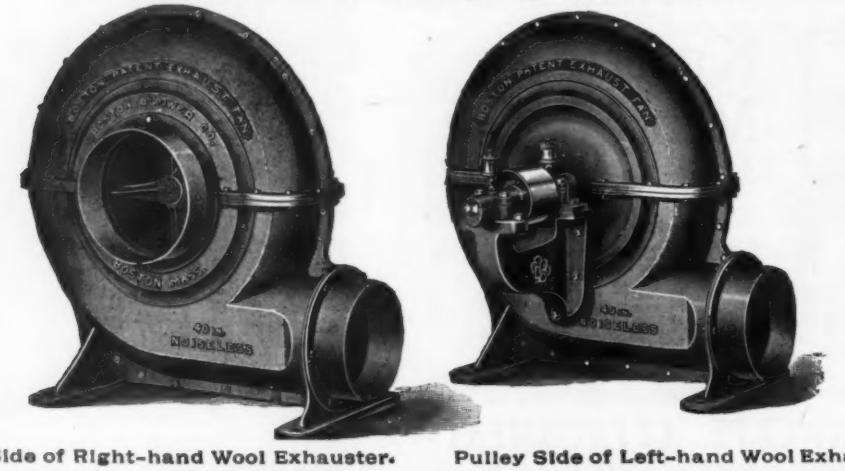
Boston Wool Exhausters, with Removable Tops.

As used in Connection with Pneumatic Conveyor System for Handling Wool, Cotton, Rags, Excelsior, Jute, etc.

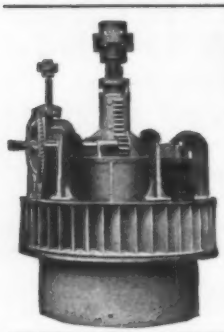


Inlet Side of Right-hand Wool Exhauster. **Pulley Side of Left-hand Wool Exhauster.**

This machine is similar in design to the regular Boston Patent Exhaust Fan, but is fitted with a special wheel for handling fibrous materials, and the top is removable.

This latter feature is especially desirable when handling wet or greasy materials or in handling anything, in fact, which would leave a deposit on the inside of fan, as the entire top may readily be removed for inspection or cleaning without disconnecting either pipe or belt connections.

BOSTON BLOWER CO., Main Office and Works: **Business and Glenwood Sts., HYDE PARK, MASS.**



Risdon=Alcott Turbine Co.

MOUNT HOLLY, NEW JERSEY, U. S. A.

RISDON CELEBRATED TURBINE
ALCOTT HIGH DUTY TURBINE

On Horizontal or Vertical Shafts.

These Turbines are recognized as the most effective water wheels made. Your inquiries should come direct to us for this class of machinery.

SAMSON TURBINE

To insure close speed regulation in a turbine it is necessary to have a gate which is easily operated. The gates on our

SAMSON TURBINES

are balanced and consequently moved with the greatest ease.

Write Department A-5 for Catalogue.

The James Leffel & Co., SPRINGFIELD, OHIO, U. S. A.

The air is kept pure and temperature comfortable by using

The "ABC" Disc Fans

Strong, Durable, Efficient

American Blower Company

Detroit

CHARLES H. SCHNITZLER,

Patentee and Sole Manufacturer of

THE PNEUMATIC CONVEYOR

For the handling of wool and cotton stock, rags, excelsior, jute and all kinds of fibrous material, wet or dry. Also spool elevators, steam heating and ventilating, and mill work generally. Blower and fan work a specialty. This conveyor is patented. Beware of infringement.

SATISFACTION GUARANTEED. Patented Oct. 15, 1889.

315 NORTH SECOND ST., - PHILADELPHIA, PA.

Water Wheel Governors

For TEXTILE MILLS

We Guarantee Satisfaction.

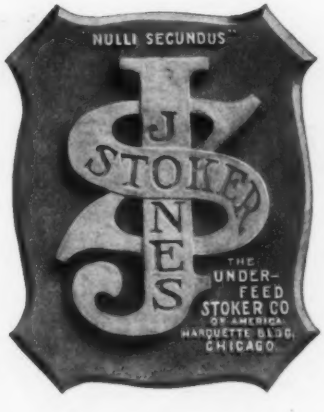
Replogle Governor Works

Write for Catalogue T. AKRON, OHIO.

JEFFREY

ELEVATING-CONVEYING MACHINERY. SEND FOR CATALOGUE.

THE JEFFREY MFG. CO. Columbus, O.



PAIR McCORMICK TURBINES

4,000 H. P., 72 ft. head, arranged to drive generator and a single turbine to drive exciter. Five settings built for the Hudson River Water Power Company's Spier Falls plant and 14 pairs 51 inch for their plant at Mechanicsville, N, Y.

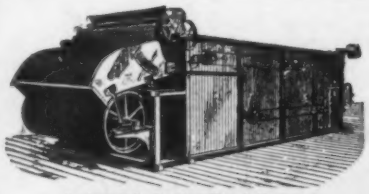
Write for Catalogue if contemplating purchase of turbines.

S. MORGAN SMITH CO.

YORK, PA.

Boston Office, 176 Federal Street.

JUN 13 1905

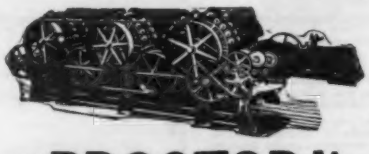


Automatic Cotton Stock Dryer.

Automatic Yarn Dryer.

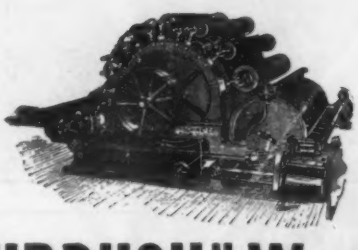
"CYCLONE" DRYERS

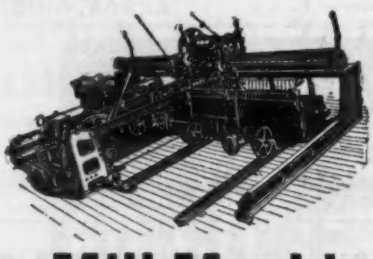
For Cotton Stock, Wool Stock, Rags,
Yarn, Cloth, Underwear, Stockings, Etc.



"PROCTOR"
Garnett Machines and Pickers

For reducing to fibre Cotton and Woolen
Waste, Cloth Clippings, Etc.





"FURBUSH" Woolen Mill Machinery

Including Pickers, Cards, Mules, Twisters,
Warpers, Dressers, Spoolers, Etc.

Manufactured by

THE PHILADELPHIA TEXTILE MACHINERY CO.,
Hancock and Somerset Sts., - PHILADELPHIA, PA.

READ THE ARTICLE ON

"Textile Advertising that has Succeeded"

in this issue of the

TEXTILE WORLD RECORD

The background is a reproduction of FIL DE SOIE

This fabric with others is being extensively advertised with much success by

The Arnold Print Works *in* The Butterick Trio

Three of their advertisements are reproduced herewith, and in another part of this issue you can read the story of the origin of their advertising campaign.

If you would like to read about "Textile Successes in Advertising" write to me and I will send you marked copies of The Woman's Herald, showing how the successes were made.

THOMAS BALMER, Advertising Manager, Butterick Bldg., New York

THE NEW FOSTER WINDER

OPEN WIND from start to finish of cone.
No press-offs from knots, no flattening of yarn.
The only perfect system of winding yarn.
for knitting purposes.

TUBE WINDERS, SKEIN WINDERS, DOUBLERS.

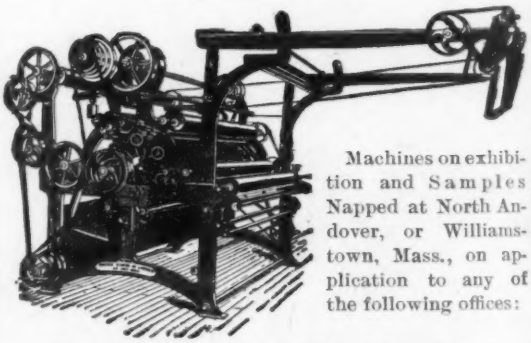
FOSTER MACHINE COMPANY,
WESTFIELD, MASS.

"The air pure and cool refreshes the soul." About some parts of your mill the men will never say that. Make life tolerable there. Buffalo Disk Fans the remedy; hot weather's ahead.

Buffalo Forge Company,
Buffalo, N. Y.

THE AMERICAN NAPPING MACHINE CO.

Own the principal patents on Napping Machines, representing the latest French, English and American Patents.



Machines on exhibition and Samples Napped at North Andover, or Williamstown, Mass., on application to any of the following offices:

Davis & Furber Machine Co.,
Builders and Selling Agents, ... North Andover, Mass.
Geo. S. Harwood & Son, 53 State St., Boston.
H. P. HEAP, Treasurer and General Manager
WILLIAMSTOWN, MASS.

Walworth Manufacturing Co.,

HIGH PRESSURE

VALVES AND FITTINGS

"Walmanco" Pipe Flanges,
"Never Stick" Blow-off Cocks, Mill Supplies.

GENERAL OFFICES:
132 FEDERAL STREET, BOSTON, MASS.
New York Office: Park Row Building.